

# *Service Manual*

ORDER NO.  
**ARP2514**

COMPACT DISC PLAYER

# **PD - 65** KU

# **PD - S901** HEM, HB, SD

- Refer to the service manual ARP2297 for PD - 41.
- This manual is applicable to the following : PD - 65/KU ; PD - S901/HEM, HB and SD.

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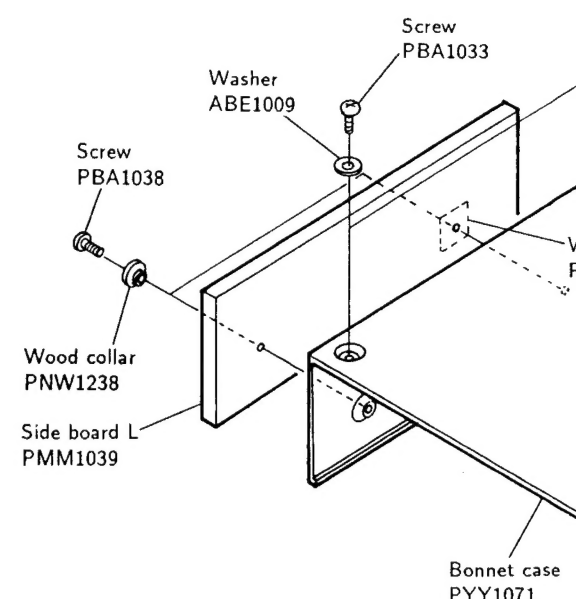
# 1. CONTRAST OF MISCELLANEOUS PARTS

## NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

PD-65/KU, PD-S901/HEM, HB, SD and PD-41/KU have the same construction except for the following :

Mark	Symbol & Description	Part No.					Remarks
		PD-41 /KU	PD-65 /KU	PD-S901 /HEM	PD-S901 /HB	PD-S901 /SD	
NSP	MOTHER BOARD assembly	PMW1486	.....	.....	.....	.....	
●	MOTHER BOARD assembly	.....	PWM1647	PWM1648	PWM1649	PWM1650	
●	MAIN BOARD assembly	PWZ2150	.....	.....	.....	.....	
NSP	MAIN BOARD assembly	.....	PWZ2382	PWZ2383	PWZ2384	PWZ2385	
NSP	PRIMARY BOARD assembly	PWZ2158	PWZ2158	PWZ2159	PWZ2161	PWZ2160	
●	ANALOG BOARD assembly	PWM1490	PWM1643	PWM1643	PWM1644	PWM1643	
●	SUB BOARD assembly	PWM1493	PWM1493	PWM1494	PWM1494	PWM1494	
NSP	FUNCTION A BOARD assembly	PWZ2168	PWZ2168	PWZ2169	PWZ2169	PWZ2169	
NSP	FUNCTION B BOARD assembly	PWZ2170	PWZ2170	PWZ2171	PWZ2171	PWZ2171	
	FL sheet	PAM1514	PAM1290	PAM1251	PAM1251	PAM1514	
NSP	Badge	PAN1035	AAM1001	PAN1035	PAN1035	PAN1035	
NSP	Front panel	PAN1211	PAN1254	PAN1255	PAN1255	PAN1255	
	Front panel assembly	PEA1167	PEA1239	PEA1240	PEA1240	PEA1240	
	Side sash	.....	PAN1220	.....	.....	.....	For control panel
	Side rubber	PEB1180	.....	PEB1180	PEB1180	PEB1180	
	Wood collar	.....	PNW1238	.....	.....	.....	For side board
NSP	Wood spacer	.....	PEC1001	.....	.....	.....	For side board
$\Delta$	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1013	
$\Delta$	Power transformer (8VA)	PTT1166	PTT1166	PTT1167	PTT1167	PTT1168	
$\Delta$	Power transformer (15VA)	PTT1206	PTT1206	PTT1207	PTT1207	PTT1208	
$\Delta$	Strain relief	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	
$\Delta$	Voltage selector	.....	.....	.....	.....	PSB1002	
	33P F.F.C / 30V	PDD1094	PDD1094	.....	.....	.....	
	31P F.F.C / 30V	.....	.....	PDD1092	PDD1092	PDD1092	
	Protector F	PHA1145	PHA1171	PHA1145	PHA1145	PHA1145	For packing
	Protector R	PHA1146	PHA1172	PHA1146	PHA1146	PHA1146	For packing
	Packing case	PHG1677	PHG1813	PHG1812	PHG1812	PHG1812	
	Screw	.....	PBA1038	.....	.....	.....	For side board
	Side board L	.....	PMM1039	.....	.....	.....	
	Side board R	.....	PMM1040	.....	.....	.....	
NSP	Rear base	PNA1538	PNA1861	PNA1858	PNA1859	PNA1860	
NSP	Under base	PNA1683	PNA1884	PNA1683	PNA1683	PNA1683	
NSP	Shield plate	PNB1299	PNB1407	PNB1299	PNB1299	PNB1299	
NSP	L angle	PNB1316	PNB1406	PNB1316	PNB1316	PNB1316	
	Control panel	PNW2066	PNW2065	PNW2066	PNW2066	PNW2066	
	Mini plug cord	PDE-319	PDE-319	.....	.....	.....	
	Remote control unit	PWW1058	PWW1057	PWW1058	PWW1058	PWW1058	
	Operating instructions	PRE1149	PRE1165	PRE1165	PRE1165	PRE1165	English, French
	Operating instructions	.....	.....	PRF1058	.....	.....	German, Italian, Dutch, Swedish, Spanish, Portuguese



LIST of assemblies (PD-41, PD-65, PD-S901)

- MOTHER BOARD assembly
  - MAIN BOARD assembly
  - PRIMARY BOARD assembly
- SUB BOARD assembly
  - FUNCTION A BOARD assembly
  - FUNCTION B BOARD assembly

•Exploded views for PD-65/KU only.

2. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 $\Omega$   $\rightarrow$  56 $\times 10^1 \rightarrow$  561 ..... RD1/8PM $\overline{561}$ J

47k $\Omega$   $\rightarrow$  47 $\times 10^3 \rightarrow$  473 ..... RD1/4PS $\overline{473}$ J

0.5 $\Omega$   $\rightarrow$  0R5 ..... RN2H $\overline{0R5}$ K

1 $\Omega$   $\rightarrow$  010 ..... RSIP $\overline{010}$ K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k $\Omega$  $\rightarrow$  562 $\times 10^1 \rightarrow$  5621 ..... RN1/4PC $\overline{5621}$ F

FOR PD – 65/KU, PD – S901/HEM,HB AND SD types.

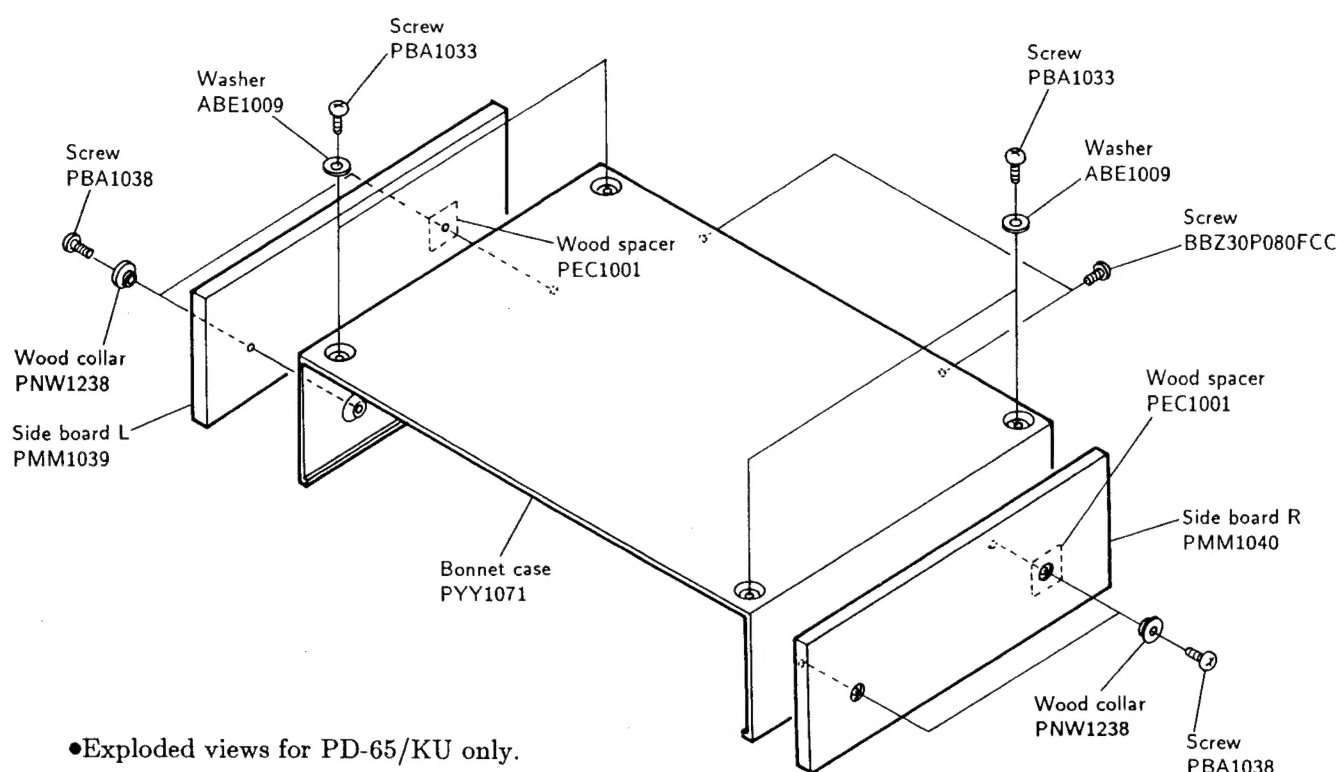
• For part numbers of PCB assemblies, refer to page 2.

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
MAIN BOARD ASSEMBLY				L391,392	AXIAL COIL	LAUR22K	
SEMICONDUCTORS				L393	AXIAL INDUCTOR	LAU010K	
IC11 REGULATOR IC NJM7805FA				CAPACITORS			
IC12 REGULATOR IC NJM7905FA				C10,11	CERAMIC CAPACITOR	PCL1029	
IC13 REGULATOR IC NJM7808FA				C13–20	CERAMIC CAPACITOR	PCL1029	
IC14 REGULATOR IC NJM7908FA				C21,22	ELECT. CAPACITOR	CEAS222M25	
IC30–32 IC PROTECTOR ICP–N10				C23	ELECT. CAPACITOR	CEAS102M25	
IC60 SYSTEM RESET IC M51957AL				C25,26	ELECT. CAPACITOR	CEAS222M16	
IC101 PRE AMP IC CXA1471S				C27,28	ELECT. CAPACITOR	CEAS222M25	
IC151 SERVO IC CXA1372S				C29,30	ELECT. CAPACITOR	CEAS102M16	
IC201 POWER OP–AMP IC LA6520				C51	ELECT. CAPACITOR	CEAS101M50	
IC202 POWER OP–AMP IC LA6517				C52	ELECT. CAPACITOR	CEAS221M50	
IC301 EFM DEMODULATION IC CXD2500AQ				C53	ELECT. CAPACITOR	CEAS100M50	
IC331 IC MC74HCU04N				C54	ELECT. CAPACITOR	CEAS470M50	
Q51 TRANSISTOR 2SB1187				C55	ELECT. CAPACITOR	CEAS330M35	
Q101 TRANSISTOR 2SA854S				C56	ELECT. CAPACITOR	CEAS101M50	
Q240 TRANSISTOR 2SA933S				C61	ELECT. CAPACITOR	CEASR33M50	
Q241 TRANSISTOR 2SC1740S				C62	ELECT. CAPACITOR	CEAS010M50	
Q301 TRANSISTOR DTC124ES				C101,102	ELECT. CAPACITOR	CEAS101M50	
Q302 TRANSISTOR DTA124ES				C103	CERAMIC CAPACITOR	CCDCH200J50	
Q321,331 TRANSISTOR DTC124ES				C104	ELECT. CAPACITOR	CEAS101M10	
Q351 TRANSISTOR DTA124ES				C105,106	ELECT. CAPACITOR	CEAS101M50	
Q391 TRANSISTOR DTC124ES				C107,108	CERAMIC CAPACITOR	CGCYX103K25	
D11–14 DIODE 11ES2				C110	CERAMIC CAPACITOR	CKCYF103Z50	
D25 DIODE RB–152LF				C151–154	ELECT. CAPACITOR	CEAS101M50	
D51,52 DIODE 11ES2				C155	CERAMIC CAPACITOR	CKCYB182K50	
D53 ZENER DIODE MTZ27C				C156	CERAMIC CAPACITOR	CGCYX333K25	
D54 ZENER DIODE MTZJ20A				C157	CERAMIC CAPACITOR	CGCYX103K25	
D56 DIODE 11ES2				C158,159	MYLAR FILM CAPACITOR	CQMA104K50	
D321 DIODE 1SS254				C160	ELECT. CAPACITOR	CEAS4R7M50	
D391–394 DIODE(PD–65 only) 1SS254				C161	MYLAR FILM CAPACITOR	CQMA104K50	
D395–399 DIODE 1SS254				C162	ELECT. CAPACITOR	CEAS010M50	
COILS, FILTERS				C163	MYLAR FILM CAPACITOR	CQMA104K50	
L30	AXIAL INDUCTOR	LAU010K		C164	CERAMIC CAPACITOR	CGCYX103K25	
L301	RADIAL INDUCTOR	LFA010K		C166	CERAMIC CAPACITOR	OCCSL101J50	
L332	COIL	PTL1003		C167	CERAMIC CAPACITOR	CKCYF103Z50	
				C168	CERAMIC CAPACITOR	CGCYX333K25	

Mark	No.	Description	Parts No.
	C169	CERAMIC CAPACITOR	CGCYX103
	C170	CERAMIC CAPACITOR	CKCYB333
	C171,172	CERAMIC CAPACITOR	CKCYB473
	C202	CERAMIC CAPACITOR	CKCYF103
	C212	CERAMIC CAPACITOR	CKCYB273
	C216–219	ELECT. CAPACITOR	CEAS221M
	C232	CERAMIC CAPACITOR	CKCYF103
	C301	CERAMIC CAPACITOR	CGCYX103
	C302	ELECT. CAPACITOR	CEAS471M
	C303	ELECT. CAPACITOR	CEAS101M
	C304	CERAMIC CAPACITOR	CGCYX103
	C305	ELECT. CAPACITOR	CEAS221M
	C306	CERAMIC CAPACITOR	CKCYB153
	C307	CERAMIC CAPACITOR	CGCYX473
	C308	CERAMIC CAPACITOR	CGCYX103
	C309	ELECT. CAPACITOR	CEASR47M
	C310	CERAMIC CAPACITOR	CKCYF103
	C311	CERAMIC CAPACITOR	CKCYB102
	C313	CERAMIC CAPACITOR	CKCYF103
	C314	CERAMIC CAPACITOR	CGDYX103
	C331	CERAMIC CAPACITOR	CGCYX473
	C332	ELECT. CAPACITOR	CEAS101M
	C334	CERAMIC CAPACITOR	CGCYX103
	C335	ELECT. CAPACITOR	CEAS470M
	C336	AUDIO FILM CAPACITOR	CFTXA103
	C337	CERAMIC CAPACITOR	OCCSL471
	C339,340	CERAMIC CAPACITOR	CGCYX103
	C391	CERAMIC CAP.(PD–65 only)	CGCYX103
	C392	CERAMIC CAP.(PD–65 only)	OCCSL101
	C395	CERAMIC CAPACITOR	CCDSL100
RESISTORS			
	VR102	VR(22k)	VRTB6VS2
	VR103	VR(1K)	VRTB6VS1
	VR151,152	VR(22k)	VRTB6VS2
		Other resistors	RD1/6PM
OTHERS			
	CN101	CONNECTOR	52045–1610
	CN351	CONNECTOR(PD–65)	HLEM33S–
	CN351	CONNECTOR(PD–S901)	HLEM31S–
	JA331	OPTICAL OUTPUT JACK	TOTX178
	JA332	JACK	PKB1004
	JA391,392	JACK(PD–65 only)	RKN1004
	JA393	JACK	RKN1004

PRIMARY BOARD ASSEMBLY

SWITCH			
$\Delta$	S1	SWITCH	PSA–009
CAPACITOR			
$\Delta$	C1	CAPACITOR (0.01 $\mu$ F)	VCG–048
OTHER			
$\Delta$		TERMINAL(PD–65)	RKC–061



•Exploded views for PD-65/KU only.

Mark No.	Description	Parts No.
C169	CERAMIC CAPACITOR	CGCYX103K25
C170	CERAMIC CAPACITOR	CKCYB332K50
C171,172	CERAMIC CAPACITOR	CKCYB472K50
C202	CERAMIC CAPACITOR	CKCYF103Z50
C212	CERAMIC CAPACITOR	CKCYB272K50
C216-219	ELECT. CAPACITOR	CEAS221M25
C232	CERAMIC CAPACITOR	CKCYF103Z50
C301	CERAMIC CAPACITOR	CGCYX103K25
C302	ELECT. CAPACITOR	CEAS471M10
C303	ELECT. CAPACITOR	CEAS101M50
C304	CERAMIC CAPACITOR	CGCYX103K25
C305	ELECT. CAPACITOR	CEAS221M25
C306	CERAMIC CAPACITOR	CKCYB152K50
C307	CERAMIC CAPACITOR	CGCYX473K25
C308	CERAMIC CAPACITOR	CGCYX103K25
C309	ELECT. CAPACITOR	CEASR47M50
C310	CERAMIC CAPACITOR	CKCYF103Z50
C311	CERAMIC CAPACITOR	CKCYB102K50
C313	CERAMIC CAPACITOR	CKCYF103Z50
C314	CERAMIC CAPACITOR	CGDYX104M25
C331	CERAMIC CAPACITOR	CGCYX473K25
C332	ELECT. CAPACITOR	CEAS101M25
C334	CERAMIC CAPACITOR	CGCYX103K25
C335	ELECT. CAPACITOR	CEAS470M25
C336	AUDIO FILM CAPACITOR	CFTXA103J50
C337	CERAMIC CAPACITOR	CCCSL471J50
C339,340	CERAMIC CAPACITOR	CGCYX103K25
C391	CERAMIC CAP.(PD-65 only)	CGCYX103K25
C392	CERAMIC CAP.(PD-65 only)	CCCSL101J50
C395	CERAMIC CAPACITOR	CCDSL100D50
<b>RESISTORS</b>		
VR102	VR(22k)	VRTB6VS223
VR103	VR(1K)	VRTB6VS102
VR151,152	VR(22k)	VRTB6VS223
Other resistors		RD1/6PM□□□J
<b>OTHERS</b>		
CN101	CONNECTOR	52045-1610
CN351	CONNECTOR(PD-65)	HLEM33S-1
CN351	CONNECTOR(PD-S901)	HLEM31S-1
JA331	OPTICAL OUTPUT JACK	TOTX178
JA332	JACK	PKB1004
JA391,392	JACK(PD-65 only)	RKN1004
JA393	JACK	RKN1004

## PRIMARY BOARD ASSEMBLY

<b>SWITCH</b>		
△ S1	SWITCH	PSA-009
<b>CAPACITOR</b>		
△ C1	CAPACITOR (0.01μF)	VCG-048
<b>OTHER</b>		
△	TERMINAL(PD-65)	RKC-061

Mark No.	Description	Parts No.
<b>ANALOG BOARD ASSEMBLY</b>		
<b>SEMICONDUCTORS</b>		
△ IC501,502	REGULATOR IC	NJM7805FA
IC512	LOGIC IC	TC74HCU04AP
IC513	IC	PD0116A
IC522,523	D/A CONVERTER IC	PD2028B
IC554,555	OP-AMP IC	NJM5532DD
△ IC601	REGULATOR IC	NJM7815FA
△ IC602	REGULATOR IC	NJM7915FA
△ IC620,621	IC PROTECTOR	ICP-N15
Q521	TRANSISTOR	DTC124ES
Q522,523	TRANSISTOR	DTA124ES
Q524,525	TRANSISTOR	DTC124ES
Q554-557	TRANSISTOR	2SC3068
Q558	N-FET	2SK246
Q559,560	P-FET	2SJ103
Q561	N-FET	2SK246
Q562,563	TRANSISTOR	2SC3068
D521	DIODE	1SS254
D550,551	DIODE	1SS254
D570,571	DIODE	1SS254
△ D610-613	DIODE	10DF2
△ D620-627	DIODE	10DF2
<b>COILS, FILTERS</b>		
L511,512	AXIAL INDUCTOR	LAU010K
L513,514	AMORPHOUS BEAD	PTH1006
L518,519	FILTER	PTH1011
L522,523	AXIAL INDUCTOR	LAU010K
L525,526	AXIAL INDUCTOR	LAU010K
L551-554	FERRITE BEADS	VTH1013
F520,521	FILTER	VTH1001
<b>CAPACITORS</b>		
C501,502	AUDIO FILM CAPACITOR	CFTXA104J50
C503,504	CERAMIC CAPACITOR	PCL1029
C505	ELECT. CAPACITOR	CEAS101M25
C506,507	AUDIO FILM CAPACITOR	CFTXA104J50
C510	AUDIO FILM CAPACITOR	CFTXA473J50
C511	CERAMIC CAPACITOR	PCL1029
C512	AUDIO FILM CAPACITOR	CFTXA103J50
C514	CERAMIC CAPACITOR	CGCYF473Z25
C515	AUDIO FILM CAPACITOR	CFTXA103J50
C516	ELECT. CAPACITOR	CEAS102M16
C517,518	CERAMIC CAPACITOR	CCCCH120J50
C519	ELECT. CAPACITOR	CEAS102M16
C520	ELECT. CAPACITOR	CEAS470M50
C521	MYLAR FILM CAPACITOR	CQMA473J50
C522	AUDIO FILM CAPACITOR	CFTXA682J50
C523	CERAMIC CAPACITOR	PCL1029
C524	ELECT. CAPACITOR	CEAS102M16
C526	MYLAR FILM CAPACITOR	CQMA104J50
C527	MYLAR FILM CAPACITOR	CQMA473J50
C528	ELECT. CAPACITOR	CEAS102M16
C529	MYLAR FILM CAPACITOR	CQMA473J50
C530,531	AUDIO FILM CAPACITOR	CFTXA682J50
C532	ELECT. CAPACITOR	CEAS102M16
C534	AUDIO FILM CAPACITOR	CFTXA104J50

Mark No.	Description	Parts No.
C535	ELECT. CAPACITOR	CEAS102M16
C538,539	CERAMIC CAPACITOR	CCCCH120J50
C540,541	CERAMIC CAPACITOR	CCDCH221J50
C542,543	CERAMIC CAPACITOR	CCCCH181J50
C544,545	CERAMIC CAPACITOR	CCCCH330J50
C546,547	CERAMIC CAPACITOR	CGCYF473Z25
C548	CERAMIC CAPACITOR	CCCCH080D50
C549	CERAMIC CAPACITOR	CCCCH080D50
C550,551	CERAMIC CAPACITOR	CCCCH181J50
C552,553	CERAMIC CAPACITOR	CCCCH330J50
C554,555	MYLAR FILM CAPACITOR	CQMA104J50
C556,557	ELECT. CAPACITOR	CEAS102M16
C558,559	MYLAR FILM CAPACITOR	CQMA104J50
C560-563	CERAMIC CAPACITOR	CCCCH470J50
C564,565	MYLAR FILM CAPACITOR	CQMA681J50
C566,567	MYLAR FILM CAPACITOR	CQMA562J50
C568-571	ELECT. CAPACITOR	CEAS471M50
C572,573	(47/50)	PCH1072
C576,577	ELECT. CAPACITOR	CEAS102M16
C578,579	CERAMIC CAPACITOR	PCL1029
C581	MYLAR FILM CAPACITOR	CQMA104J50
C582,583	AUDIO FILM CAPACITOR	CFTXA683J50
C586	AUDIO FILM CAPACITOR	CFTXA473J50
C587,588	ELECT. CAPACITOR	CEANP220M25
C589	ELECT. CAPACITOR	CEAS102M16
C590	MYLAR FILM CAPACITOR	CQMA104J50
C591	AUDIO FILM CAPACITOR	CFTXA682J50
C593,594	ELECT. CAPACITOR	CEAS102M16
C595	MYLAR FILM CAPACITOR	CQMA104J50
C597	ELECT. CAPACITOR	CEAS102M16
C601	ELECT. CAPACITOR	CENA102M35
C604,605	ELECTR. CAPACITOR	PCH1102
C606,607	ELECT. CAPACITOR	CENA102M35
C608-618	CERAMIC CAPACITOR	PCL1029

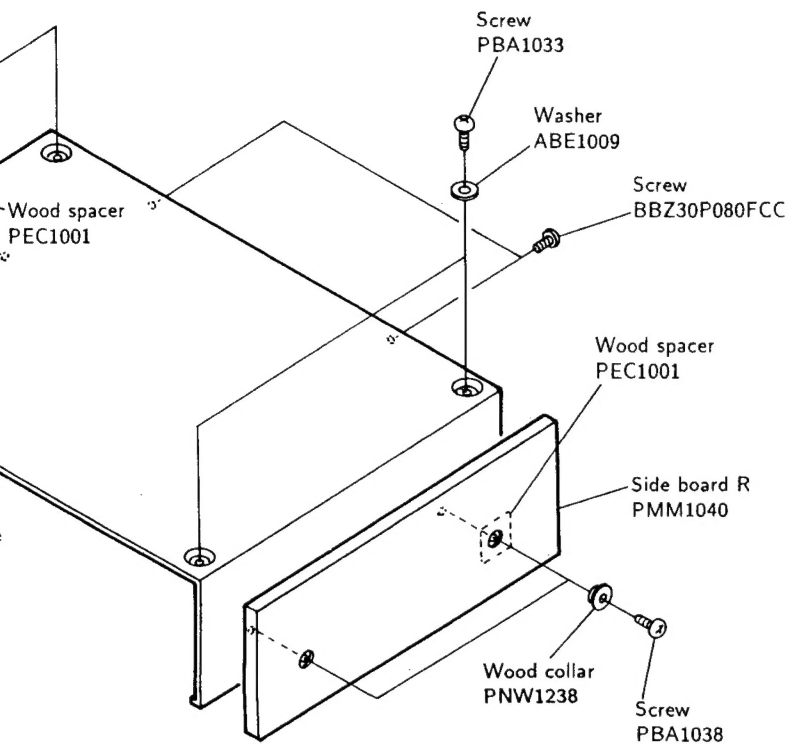
<b>RESISTORS</b>		
R502	CARBON FILM RESISTOR	RD1/4PM331J
R514	CARBON FILM RESISTOR	RD1/4PM331J
R540-567	CARBON FILM RESISTOR	RD1/4PM□□□J
R568-581	CARBON FILM RESISTOR	RDR1/4PM□□□J
R582-585	CARBON FILM RESISTOR	RDR1/2PM□□□J
R588,589	CARBON FILM RESISTOR	RDR1/2PM271J
R590,591	CARBON FILM RESISTOR	RDR1/4PM511J
R593,594	CARBON FILM RESISTOR	RDR1/4PM331J
Other resistors		RD1/6PM□□□J

<b>OTHERS</b>		
JA551	1P PIN JACK(W)	RKB1010
JA552	1P PIN JACK (R)	RKB1011
X512	XTAL RES (OSC)	PSS1011
CN501	CONNECTOR(10P)	KPC10

## FUNCTION A BOARD ASSEMBLY

<b>SEMICONDUCTORS</b>		
IC401	MICROCOMPUTER,IC	PD4329A



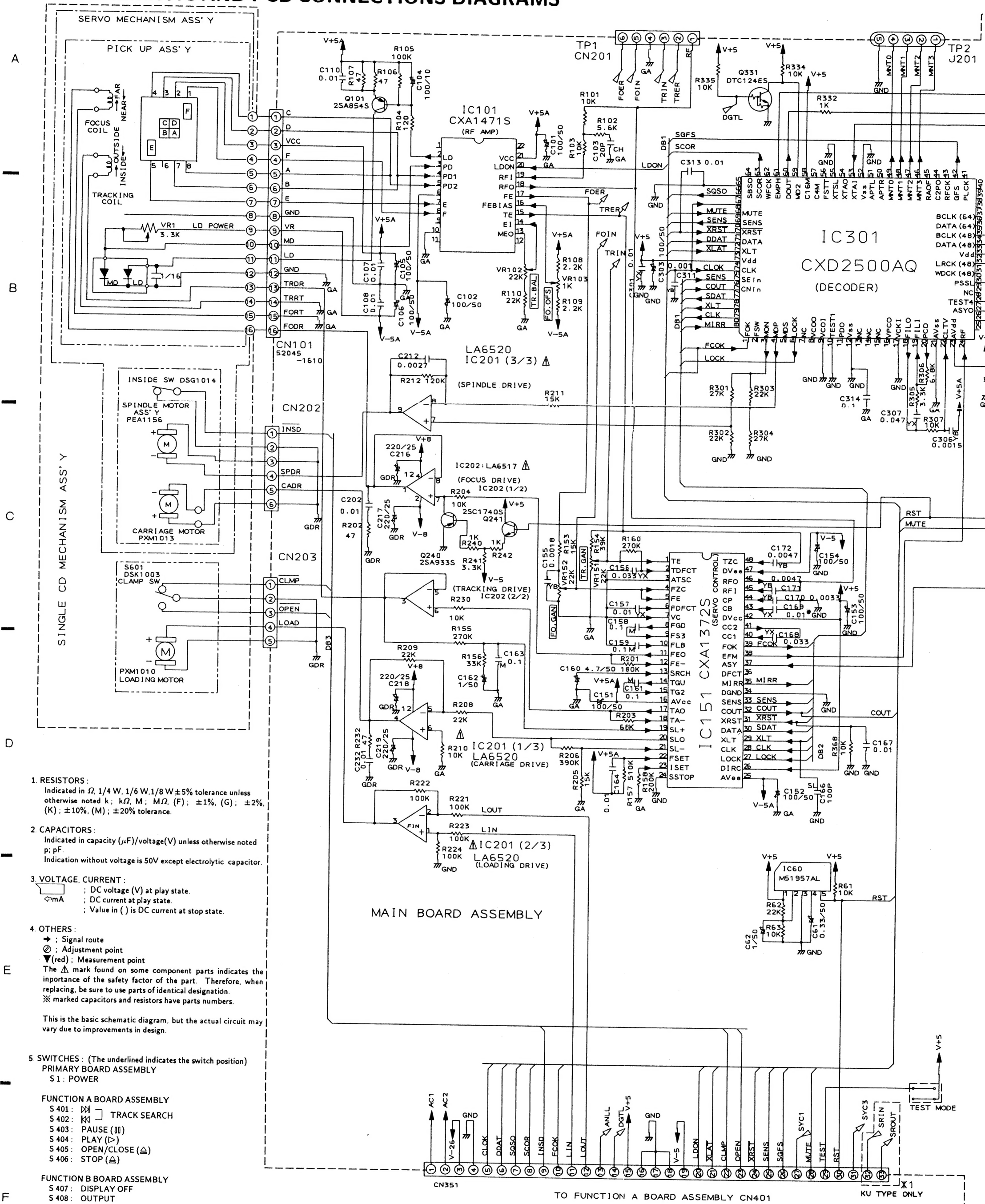


	Mark No.	Description	Parts No.
	<b>ANALOG BOARD ASSEMBLY</b>		
	<b>SEMICONDUCTORS</b>		
	△ IC501,502	REGULATOR IC	NJM7805FA
	IC512	LOGIC IC	TC74HCU04AP
	IC513	IC	PD0116A
	IC522,523	D/A CONVERTER IC	PD2028B
	IC554,555	OP-AMP IC	NJM5532DD
	△ IC601	REGULATOR IC	NJM7815FA
	△ IC602	REGULATOR IC	NJM7915FA
	△ IC620,621	IC PROTECTOR	ICP-N15
	Q521	TRANSISTOR	DTC124ES
	Q522,523	TRANSISTOR	DTA124ES
	Q524,525	TRANSISTOR	DTC124ES
	Q554-557	TRANSISTOR	2SC3068
	Q558	N-FET	2SK246
	Q559,560	P-FET	2SJ103
	Q561	N-FET	2SK246
	Q562,563	TRANSISTOR	2SC3068
	D521	DIODE	1SS254
	D550,551	DIODE	1SS254
	D570,571	DIODE	1SS254
	△ D610-613	DIODE	10DF2
	△ D620-627	DIODE	10DF2
	<b>COILS, FILTERS</b>		
	L511,512	AXIAL INDUCTOR	LAU010K
	L513,514	AMORPHOUS BEAD	PTH1006
	L518,519	FILTER	PTH1011
	L522,523	AXIAL INDUCTOR	LAU010K
	L525,526	AXIAL INDUCTOR	LAU010K
	L551-554	FERRITE BEADS	VTH1013
	F520,521	FILTER	VTH1001
	<b>CAPACITORS</b>		
	C501,502	AUDIO FILM CAPACITOR	CFTXA104J50
	C503,504	CERAMIC CAPACITOR	PCL1029
	C505	ELECT. CAPACITOR	CEAS101M25
	C506,507	AUDIO FILM CAPACITOR	CFTXA104J50
	C510	AUDIO FILM CAPACITOR	CFTXA473J50
	C511	CERAMIC CAPACITOR	PCL1029
	C512	AUDIO FILM CAPACITOR	CFTXA103J50
	C514	CERAMIC CAPACITOR	CGCYF473Z25
	C515	AUDIO FILM CAPACITOR	CFTXA103J50
	C516	ELECT. CAPACITOR	CEAS102M16
	C517,518	CERAMIC CAPACITOR	CCCCH120J50
	C519	ELECT. CAPACITOR	CEAS102M16
	C520	ELECT. CAPACITOR	CEAS470M50
	C521	MYLAR FILM CAPACITOR	CQMA473J50
	C522	AUDIO FILM CAPACITOR	CFTXA682J50
	C523	CERAMIC CAPACITOR	PCL1029
	C524	ELECT. CAPACITOR	CEAS102M16
	C526	MYLAR FILM CAPACITOR	CQMA104J50
	C527	MYLAR FILM CAPACITOR	CQMA473J50
	C528	ELECT. CAPACITOR	CEAS102M16
	C529	MYLAR FILM CAPACITOR	CQMA473J50
	C530,531	AUDIO FILM CAPACITOR	CFTXA682J50
	C532	ELECT. CAPACITOR	CEAS102M16
	C534	AUDIO FILM CAPACITOR	CFTXA104J50

Mark No.	Description	Parts No.
C535	ELECT. CAPACITOR	CEAS102M16
C538,539	CERAMIC CAPACITOR	CCCCH120J50
C540,541	CERAMIC CAPACITOR	CCDCH221J50
C542,543	CERAMIC CAPACITOR	CCCCH181J50
C544,545	CERAMIC CAPACITOR	CCCCH330J50
C546,547	CERAMIC CAPACITOR	CGCYF473Z25
C548	CERAMIC CAPACITOR	CCCCH080D50
C549	CERAMIC CAPACITOR	CCCCH080D50
C550,551	CERAMIC CAPACITOR	CCCCH181J50
C552,553	CERAMIC CAPACITOR	CCCCH330J50
C554,555	MYLAR FILM CAPACITOR	CQMA104J50
C556,557	ELECT. CAPACITOR	CEAS102M16
C558,559	MYLAR FILM CAPACITOR	CQMA104J50
C560-563	CERAMIC CAPACITOR	CCCCH470J50
C564,565	MYLAR FILM CAPACITOR	CQMA681J50
C566,567	MYLAR FILM CAPACITOR	CQMA562J50
C568-571	ELECT. CAPACITOR	CEAS471M50
C572,573	(47/50)	PCH1072
C576,577	ELECT. CAPACITOR	CEAS102M16
C578,579	CERAMIC CAPACITOR	PCL1029
C581	MYLAR FILM CAPACITOR	CQMA104J50
C582,583	AUDIO FILM CAPACITOR	CFTXA683J50
C586	AUDIO FILM CAPACITOR	CFTXA473J50
C587,588	ELECT. CAPACITOR	CEANP220M25
C589	ELECT. CAPACITOR	CEAS102M16
C590	MYLAR FILM CAPACITOR	CQMA104J50
C591	AUDIO FILM CAPACITOR	CFTXA682J50
C593,594	ELECT. CAPACITOR	CEAS102M16
C595	MYLAR FILM CAPACITOR	CQMA104J50
C597	ELECT. CAPACITOR	CEAS102M16
C601	ELECT. CAPACITOR	CENA102M35
C604,605	ELECTR. CAPACITOR	PCH1102
C606,607	ELECT. CAPACITOR	CENA102M35
C608-618	CERAMIC CAPACITOR	PCL1029
<b>RESISTORS</b>		
R502	CARBON FILM RESISTOR	RD1/4PM331J
R514	CARBON FILM RESISTOR	RD1/4PM331J
R540-567	CARBON FILM RESISTOR	RD1/4PM□□□J
R568-581	CARBON FILM RESISTOR	RDR1/4PM□□□J
R582-585	CARBON FILM RESISTOR	RDR1/2PM□□□J
R588,589	CARBON FILM RESISTOR	RDR1/2PM271J
R590,591	CARBON FILM RESISTOR	RDR1/4PM511J
R593,594	CARBON FILM RESISTOR	RDR1/4PM331J
	Other resistors	RD1/6PM□□□J
<b>OTHERS</b>		
JA551	1P PIN JACK(W)	RKB1010
JA552	1P PIN JACK (R)	RKB1011
X512	XTAL RES (OSC)	PSS1011
CN501	CONNECTOR(10P)	KPC10
<b>FUNCTION A BOARD ASSEMBLY</b>		
<b>SEMICONDUCTORS</b>		
IC401	MICROCOMPUTER,IC	PD4329A

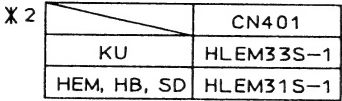
Mark No.	Description	Parts No.
Q402,403	TRANSISTOR	DTC124ES
Q404,405	TRANSISTOR	DTA124ES
D401	LED	AA0045
D402	LED	BR0045
D411-416	DIODE	1SS254
<b>SWITCHES</b>		
S401-406	SWITCH	PSG-065
<b>COILS, FILTERS</b>		
L401,402	AXIAL INDUCTOR	LAU010K
<b>CAPACITORS</b>		
C401,402	ELECT. CAPACITOR	CEJA470M16
C403	CERAMIC CAPACITOR	CKPUYF103Z25
C404	ELECT. CAPACITOR	CEJA470M16
C405	CERAMIC CAPACITOR	CKPUYF103Z25
C406-408	CERAMIC CAPACITOR	CGCYX103K25
C409	CERAMIC CAPACITOR	CKCYF103Z50
C411-416	AXIAL CERAMIC C.	CCPUCH100J50
<b>RESISTORS</b>		
	All resistors	RD1/6PM□□□J
<b>OTHERS</b>		
CN401	CONNECTOR(PD-65)	HLEM33R-1
CN401	CONNECTOR(PD-S901)	HLEM31R-1
V401	FL TUBE	PEL1025
X401	CERAMIC RESONATOR	VSS1014
	REMOTE SENSOR	SBX1610-51
<b>FUNCTION B BOARD ASSEMBLY</b>		
<b>SEMICONDUCTORS</b>		
D403	LED	SLH-34YC3H3
D404,405	LED	SLH-34VC3H3
D417	DIODE	1SS254
<b>SWITCHES</b>		
S407,408	SWITCH	PSG-065
<b>CAPACITOR</b>		
C417	AXIAL CERAMIC C.	CCPUCH100J50

### 3. SCHEMATIC AND PCB CONNECTIONS DIAGRAMS





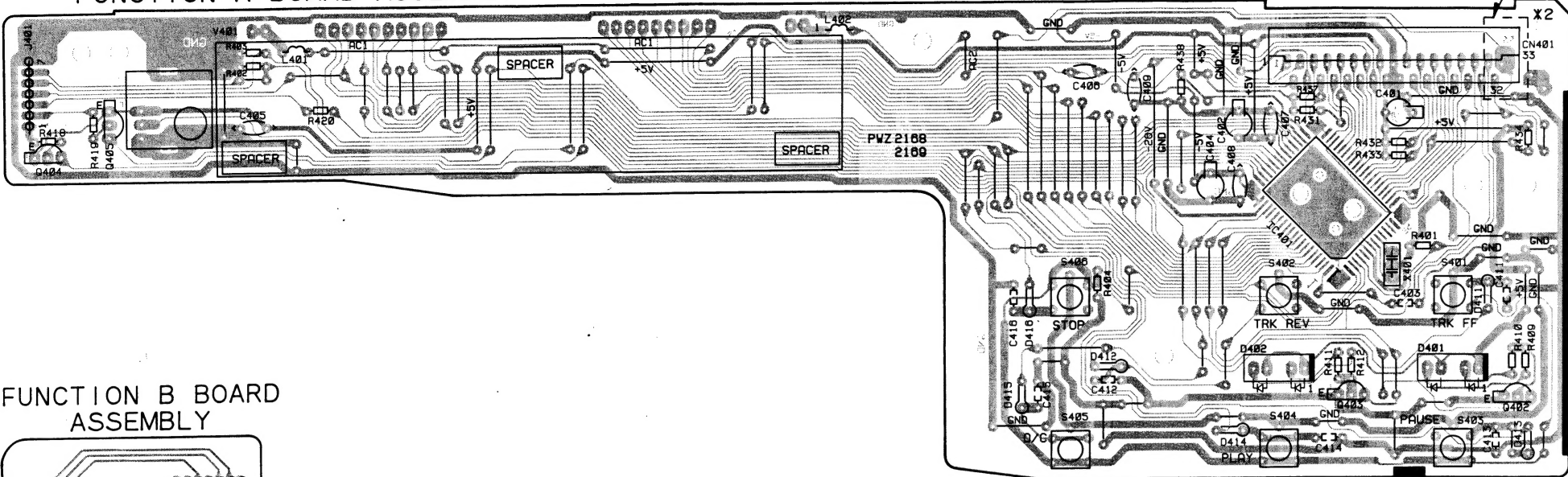






FUNCTION A BOARD ASSEMBLY

A



X2	CN401
KU	33 pins
HEM,SD,HB	31 pins

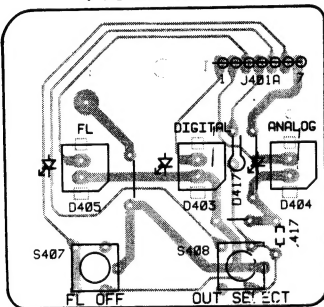
KU TYPE ONLY

Q405  
Q404  
IC401

Q403  
Q402

FUNCTION B BOARD ASSEMBLY

B



P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
		Zenner diode			Electrolytic capacitor (Non polarized)
		LED			Electrolytic capacitor (Noiseless)
		Varactor			Electrolytic capacitor (Polarized)
		Tact switch			Power capacitor
		Inductor			Semi-fixed resistor
		Coil			Resistor array
		Transformer			Resistor
		Filter			Resonator
					Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with shows negative terminal.
4. The diode marked with shows cathode side.
5. The transistor terminal marked with shows emitter.

Line Voltage Selection

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wires A and B as follows.

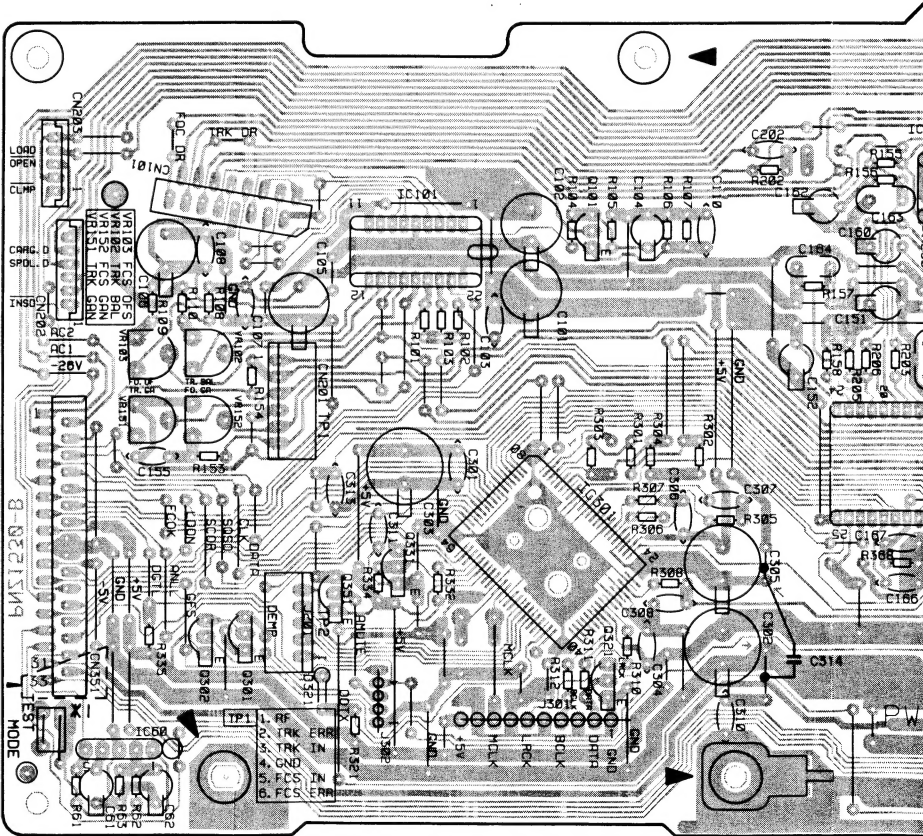
Voltage	Jumper wires A and B position
220 V-230 V	a
230 V-240 V	b

4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220 V label
AXX-192	240 V label

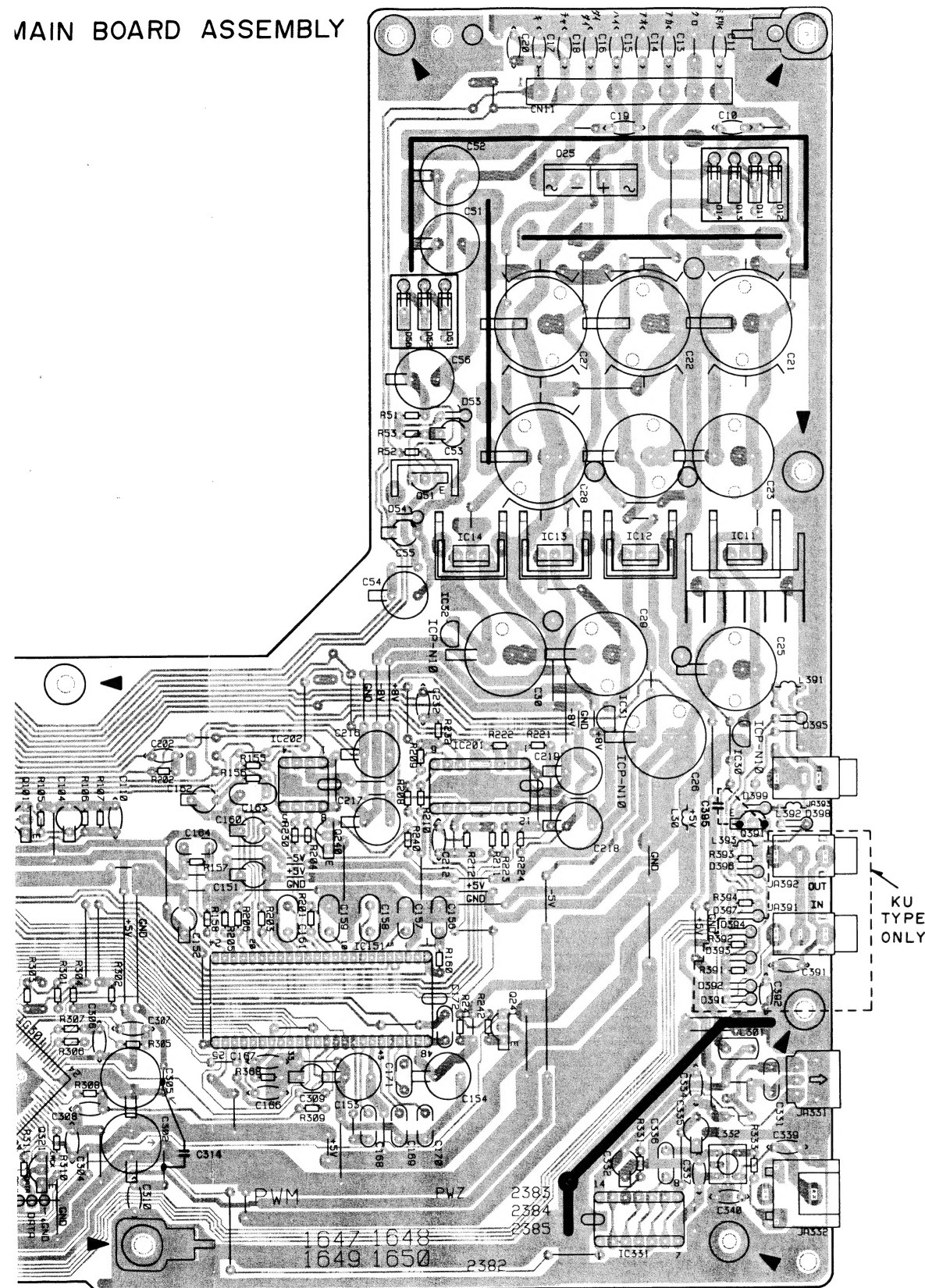
X1	CN351
KU	33 pins
HEM,SD,HB	31 pins

KU TYPE ONLY



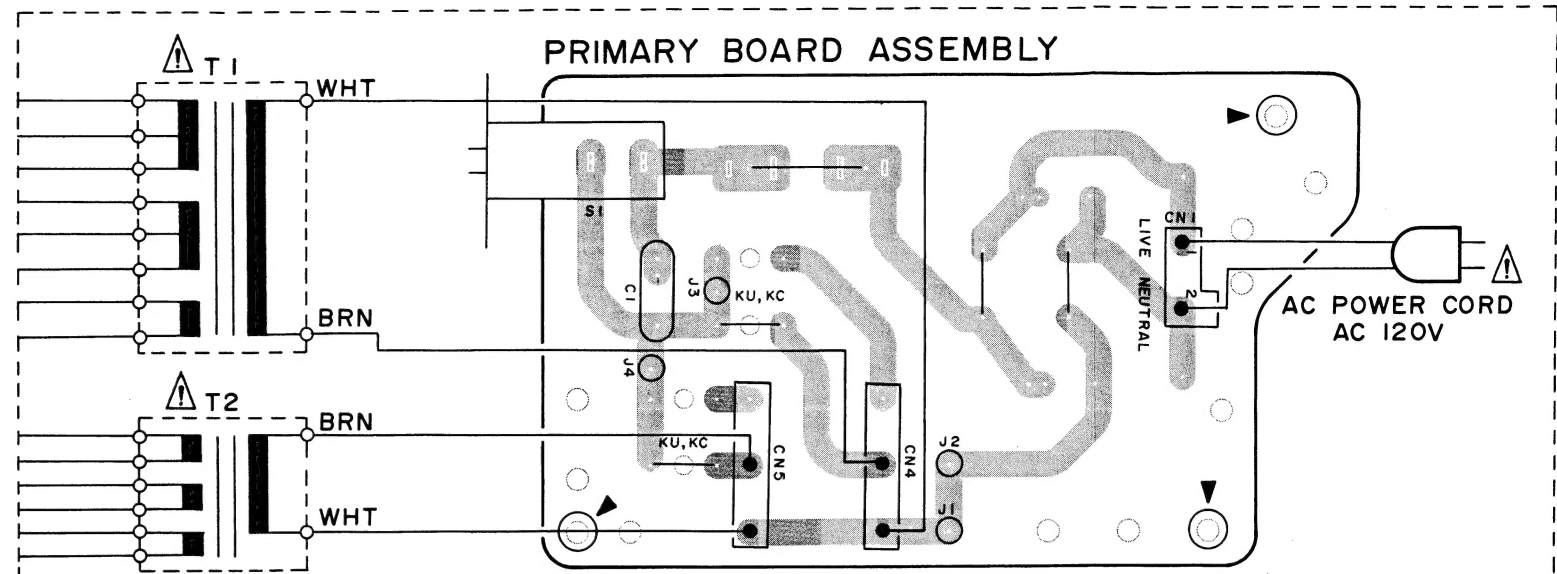
VRI03 VRI02 TP1  
VRI51 VRI52 TP2  
IC60 Q301 Q351 Q331 IC301 Q101  
Q302 IC101 Q321

# MAIN BOARD ASSEMBLY

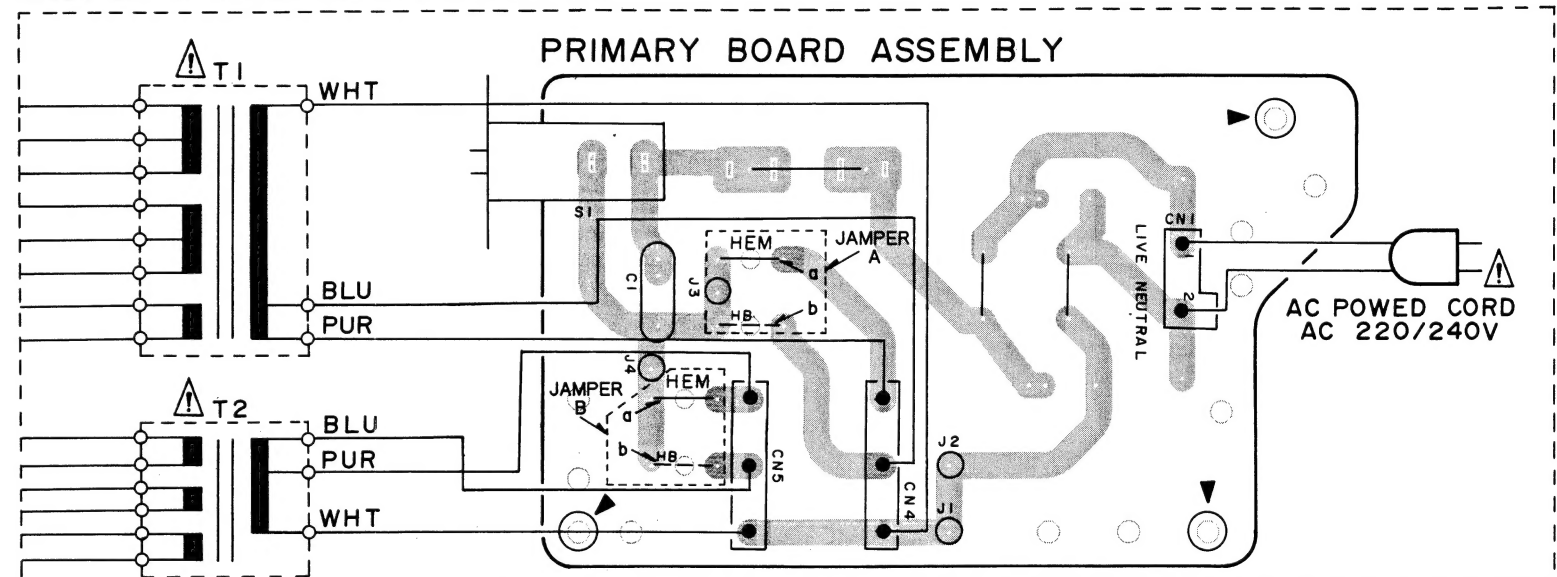


Q101 Q321 IC202 Q240 Q51 IC14 IC13 IC12 IC11 IC151 IC32 IC201 IC31 IC30 Q241 IC331 Q391

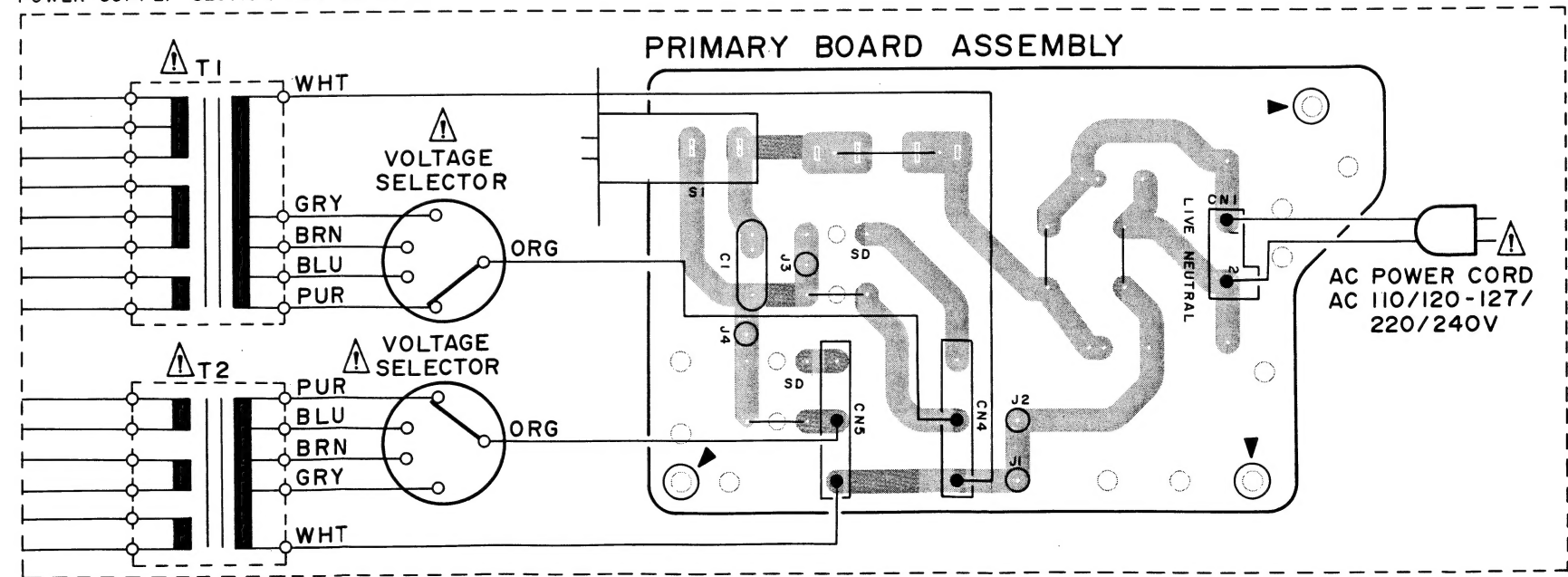
## POWER SUPPLY SECTION FOR KU TYPE



## POWER SUPPLY SECTION FOR HB AND HEM TYPES

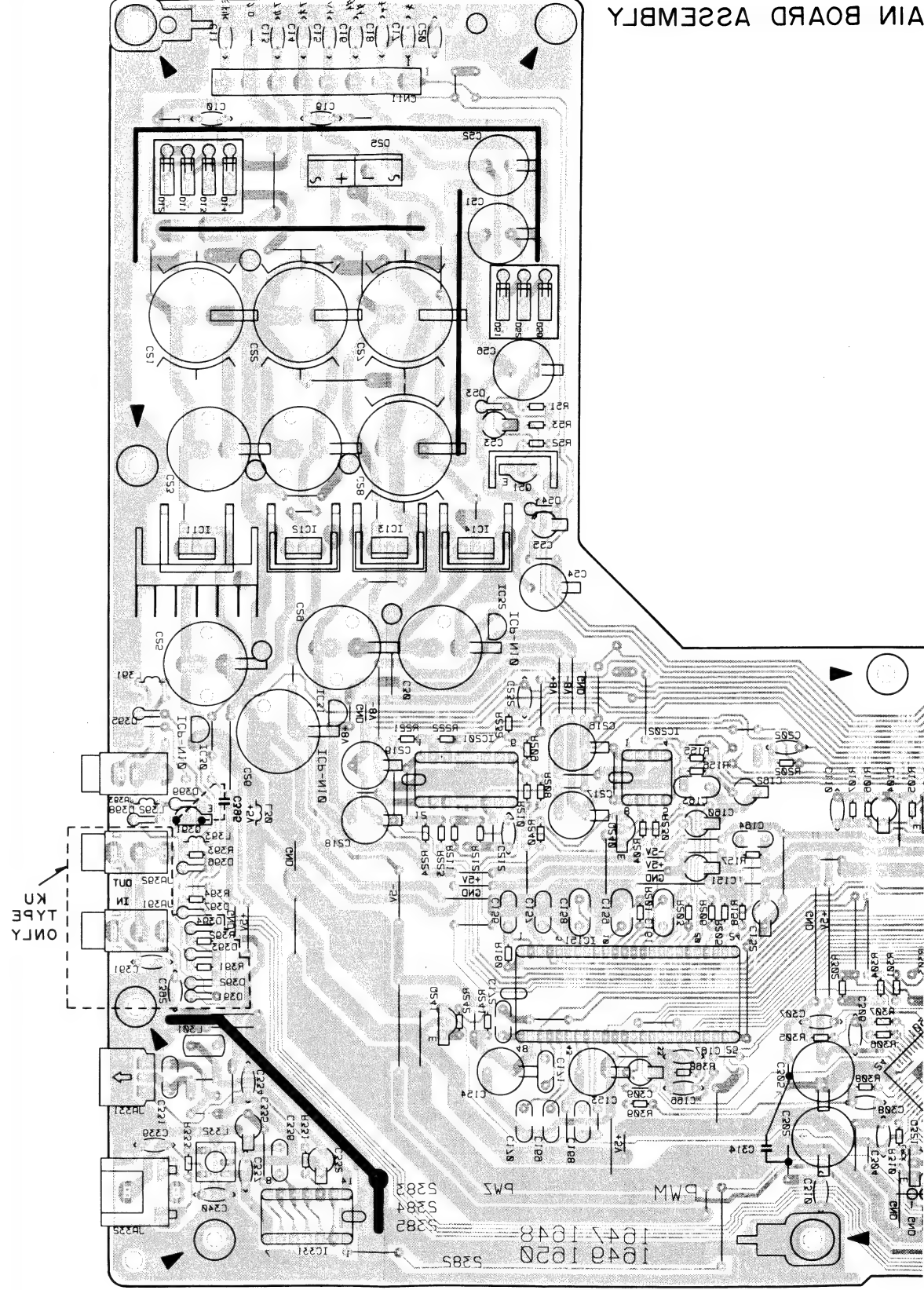


## POWER SUPPLY SECTION FOR SD TYPE



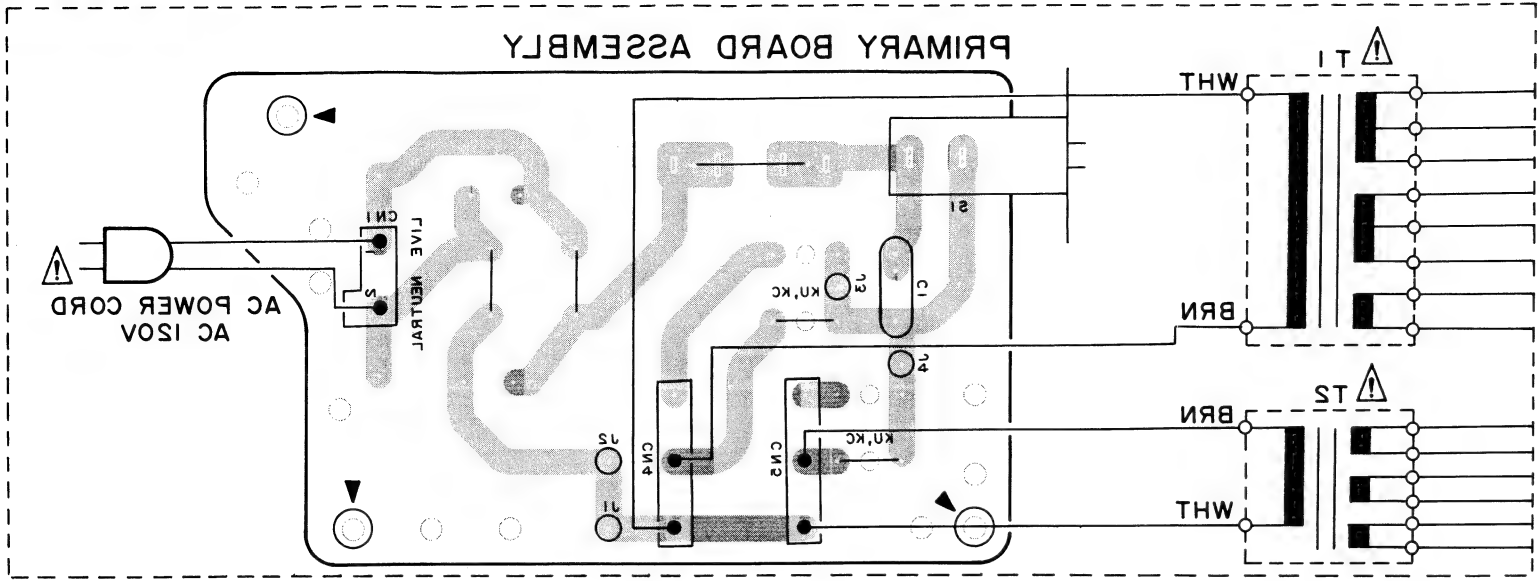


# MAIN BOARD ASSEMBLY

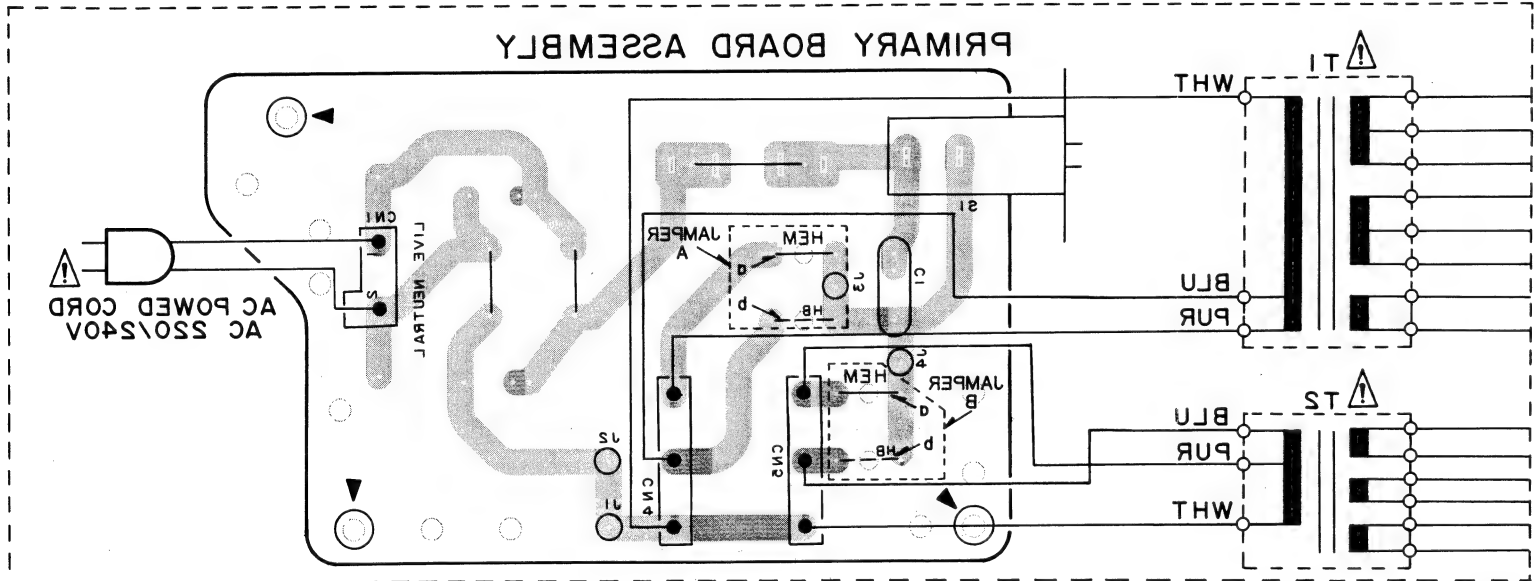


Q351 IC31 IC331 Q361  
 IC121 IC35 IC501 IC31 IC30  
 IC505 Q540 Q21 IC14 IC13 IC15 IC11

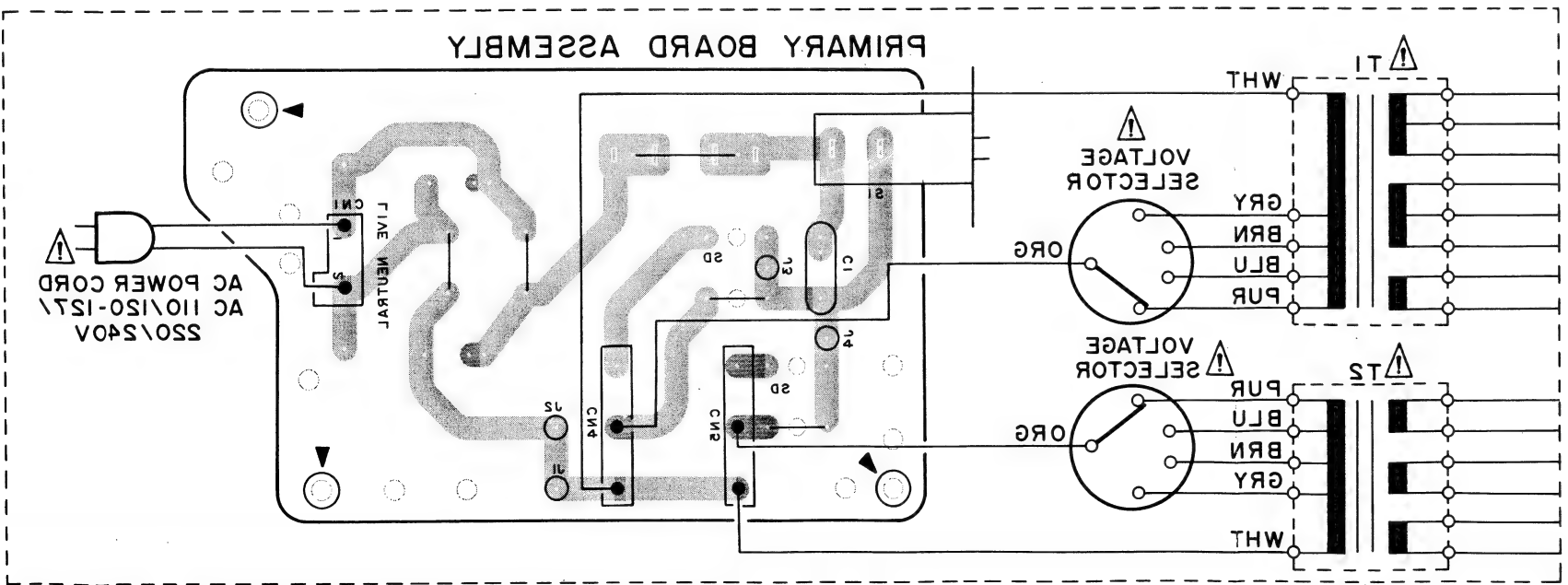
## POWER SUPPLY SECTION FOR KU TYPE



## POWER SUPPLY SECTION FOR HB AND HEM TYPES



## POWER SUPPLY SECTION FOR SD TYPE



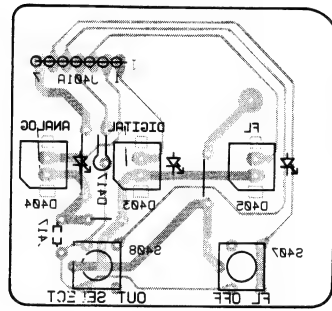
A

B

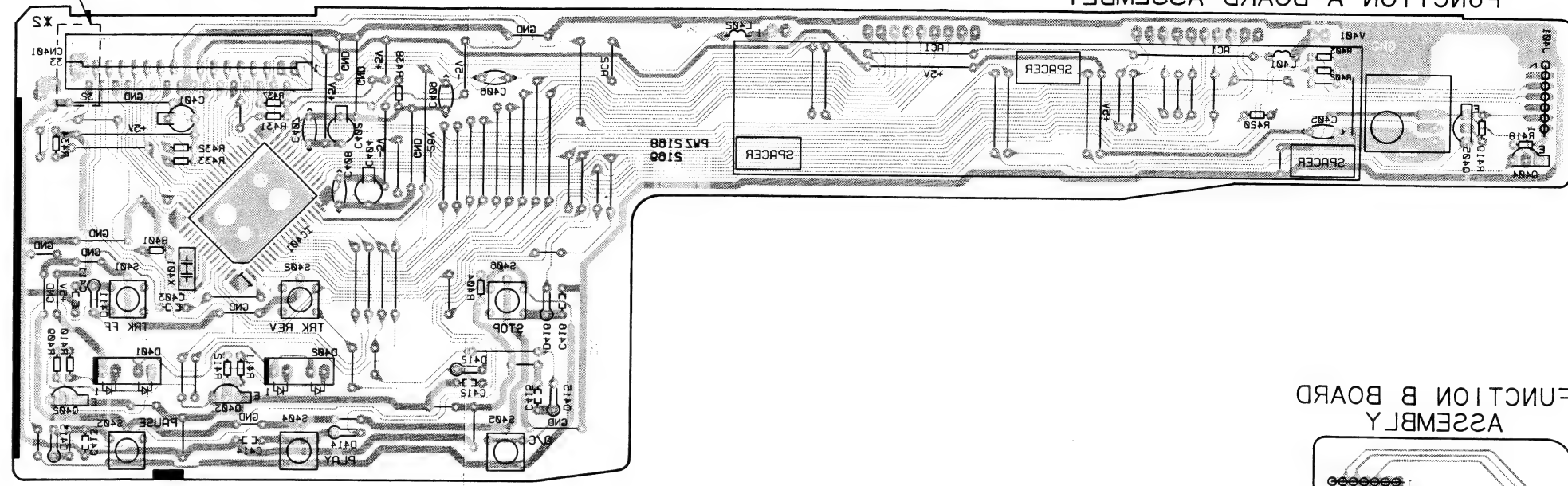
C

D

FUNCTION B BOARD ASSEMBLY



FUNCTION A BOARD ASSEMBLY



HEW'D07HB	31 pins
KU	33 pins
CN401	

KU TYPE ONLY

IC401  
Q404  
Q402

Q405  
Q403

HEW'D07HB	31 pins
KU	33 pins
CN351	

KU TYPE ONLY

VR103 VR105 TP1  
VR151 VR152 TP5

Q305 IC101 Q301 Q321 Q331  
Q351 IC301 Q101

ICS

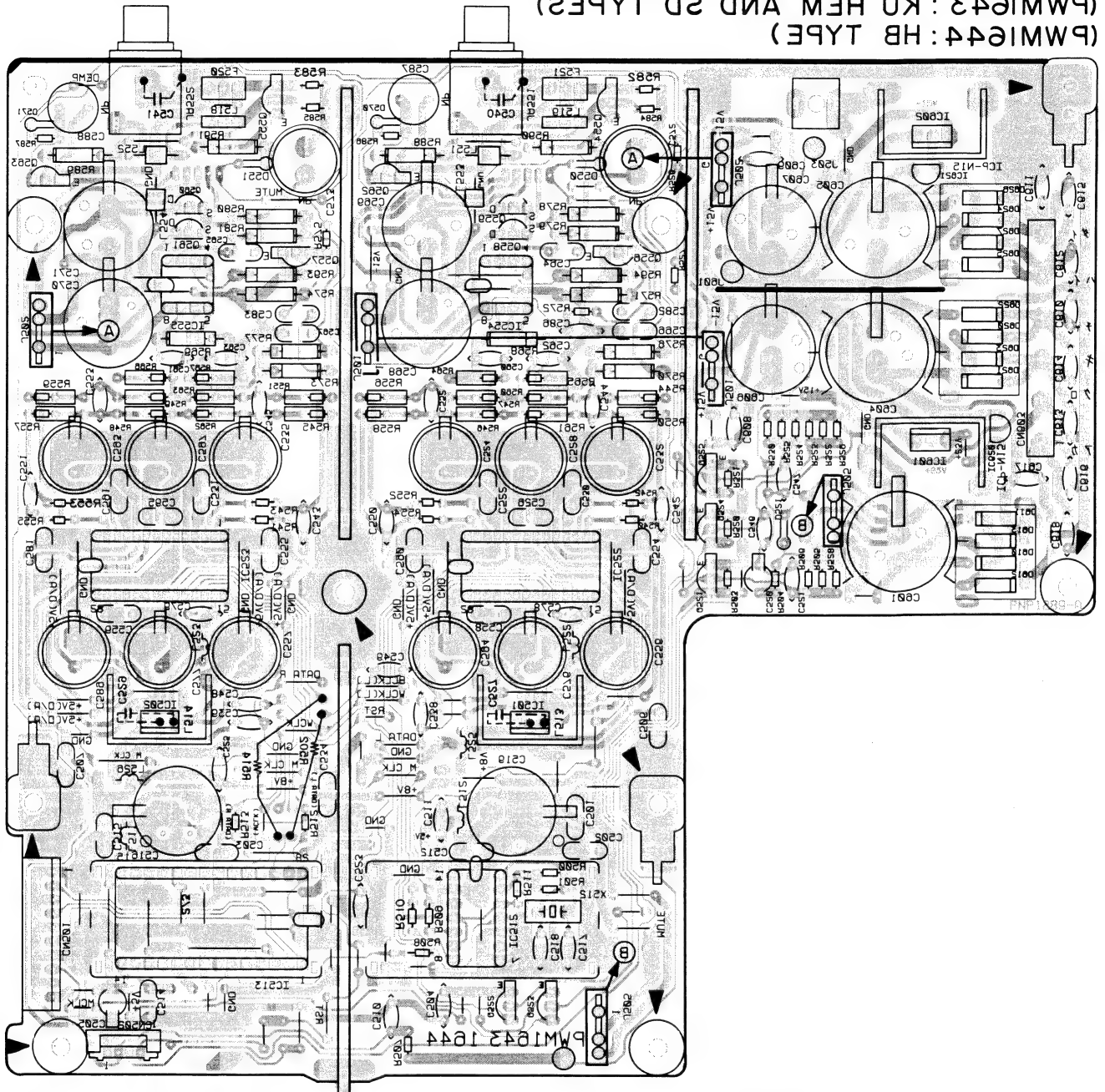
This P.C.B. connection diagram is viewed from the foil side.

MAIN BOARD ASSEMBLY



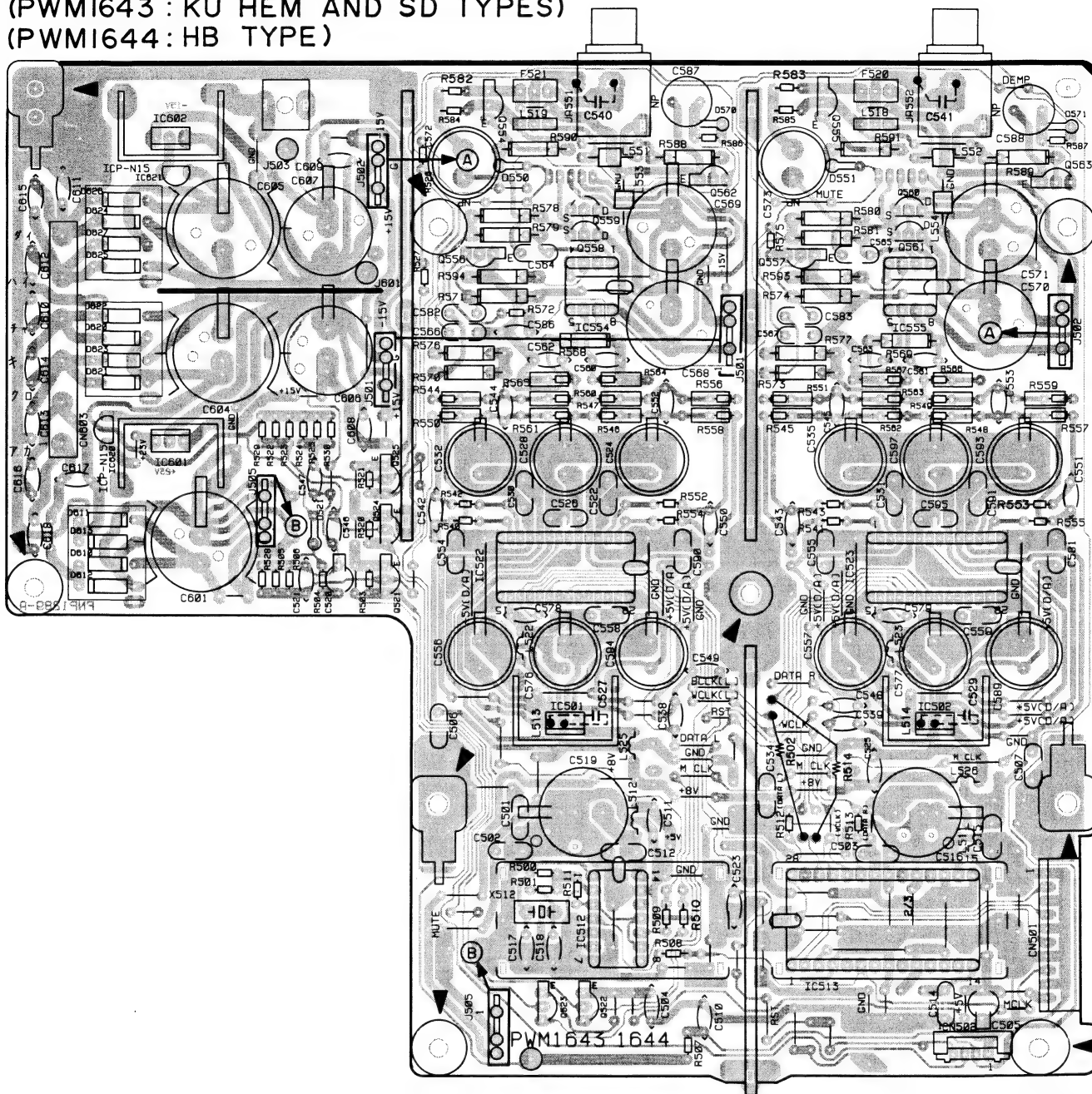
This P.C.B. connection diagram is viewed from the foil side.

(PWM1644: HB TYPE)  
(PWM1643: KU HEM AND 2D TYPE)  
ANALOG BOARD ASSEMBLY



IC201 IC202 IC203 IC204 IC205 IC206 IC207 IC208 IC209 IC210 IC211 IC212 IC213 IC214 IC215 IC216 IC217 IC218 IC219 IC220 IC221 IC222 IC223 IC224 IC225 IC226 IC227 IC228 IC229 IC230 IC231 IC232 IC233 IC234 IC235 IC236 IC237 IC238 IC239 IC240 IC241 IC242 IC243 IC244 IC245 IC246 IC247 IC248 IC249 IC250  
Q201 Q202 Q203 Q204 Q205 Q206 Q207 Q208 Q209 Q210 Q211 Q212 Q213 Q214 Q215 Q216 Q217 Q218 Q219 Q220 Q221 Q222 Q223 Q224 Q225 Q226 Q227 Q228 Q229 Q230 Q231 Q232 Q233 Q234 Q235 Q236 Q237 Q238 Q239 Q240 Q241 Q242 Q243 Q244 Q245 Q246 Q247 Q248 Q249 Q250  
Q201 Q202 Q203 Q204 Q205 Q206 Q207 Q208 Q209 Q210 Q211 Q212 Q213 Q214 Q215 Q216 Q217 Q218 Q219 Q220 Q221 Q222 Q223 Q224 Q225 Q226 Q227 Q228 Q229 Q230 Q231 Q232 Q233 Q234 Q235 Q236 Q237 Q238 Q239 Q240 Q241 Q242 Q243 Q244 Q245 Q246 Q247 Q248 Q249 Q250  
Q201 Q202 Q203 Q204 Q205 Q206 Q207 Q208 Q209 Q210 Q211 Q212 Q213 Q214 Q215 Q216 Q217 Q218 Q219 Q220 Q221 Q222 Q223 Q224 Q225 Q226 Q227 Q228 Q229 Q230 Q231 Q232 Q233 Q234 Q235 Q236 Q237 Q238 Q239 Q240 Q241 Q242 Q243 Q244 Q245 Q246 Q247 Q248 Q249 Q250

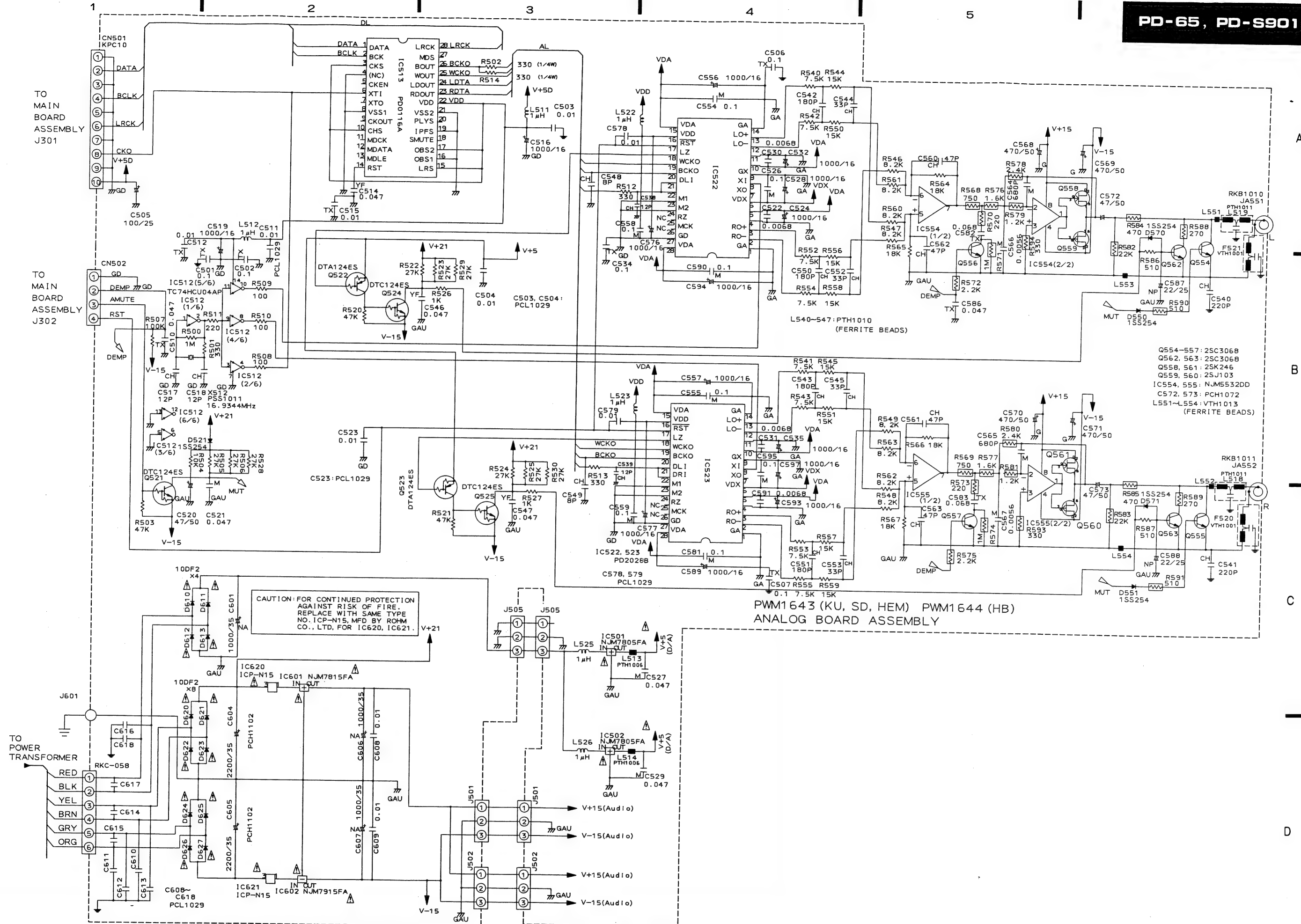
# ANALOG BOARD ASSEMBLY (PWM1643 : KU HEM AND SD TYPES) (PWM1644 : HB TYPE)



IC620 IC602  
IC621  
IC601

Q525 Q554 IC501 Q559  
Q524 Q556 IC522 Q558  
Q521 Q523 IC554  
Q522  
IC512

Q562 Q555 Q560 IC502 Q563  
Q557 Q561 IC523  
IC513 IC555





**SERVICE GUIDE**

ORDER NO.  
**ARP2318**

**COMPACT DISC PLAYER**

# PD-41

**PD-9700**

**PD-31**

**PD-8700**

**PD-8700-S**

**PD-7700**

**PD-7700-S**

- For information on performing repair works, refer to the respective service manuals, ARP2297(PD-41, PD-9700) and ARP2228(PD-31, PD-8700, PD-8700-S, PD-7700, PD-7700-S).

## CONTENTS

- 1. DISASSEMBLY ..... 2
- 2. MECHANISM DESCRIPTION ..... 7

**PIONEER ELECTRONIC CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan  
**PIONEER ELECTRONICS SERVICE INC.** P.O. Box 1760, Long Beach, California 90801 U.S.A.  
**PIONEER ELECTRONICS OF CANADA, INC.** 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada  
**PIONEER ELECTRONIC [EUROPE] N.V.** Keetberglaan 1, 9120 Beveren, Belgium  
**PIONEER ELECTRONICS AUSTRALIA PTY. LTD.** 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911  
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FI JUL. 1991



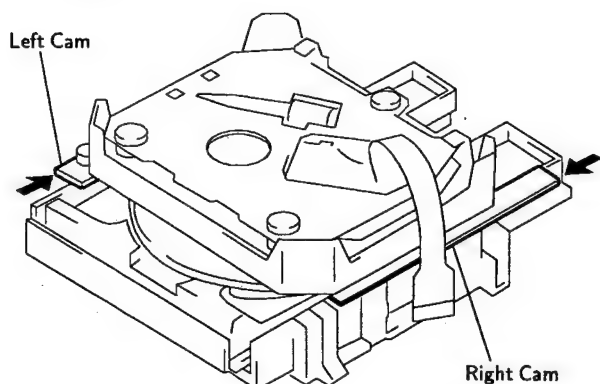
# 1. DISASSEMBLY

## 1.1 DISASSEMBLING LOADING MECHANISM ASSEMBLY

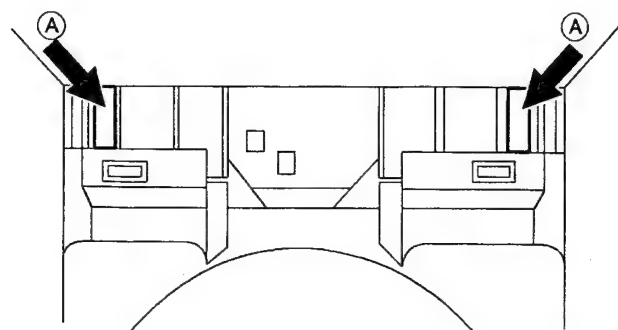
### Tray Removal

- ① Open the tray all the way.

*Note :* If you slide the right cam and the left cam in the direction of the arrow, you can open the tray by hand.

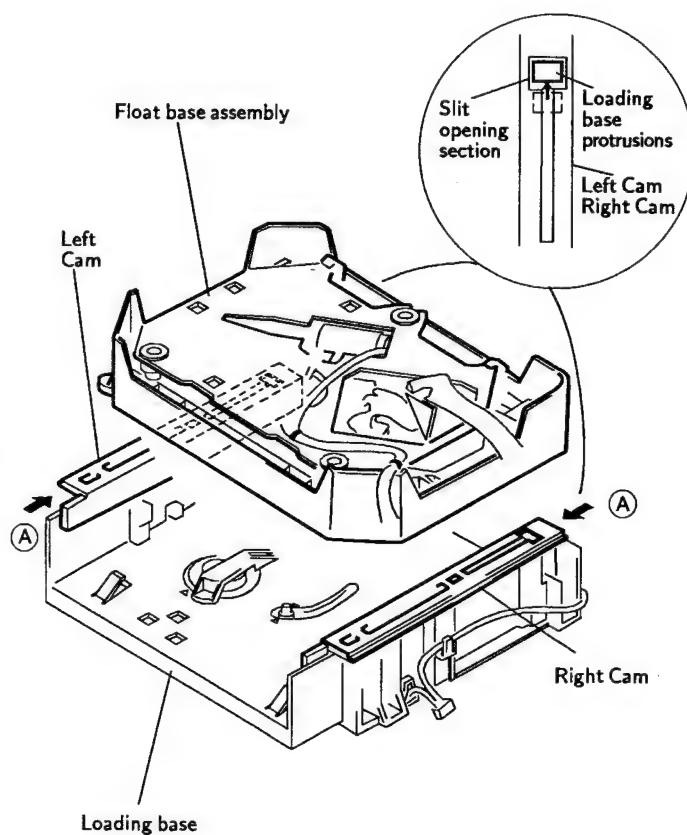


- ② While pressing the plastic springs section (A) at the rear of the tray left and right at the same time, pull out the tray.



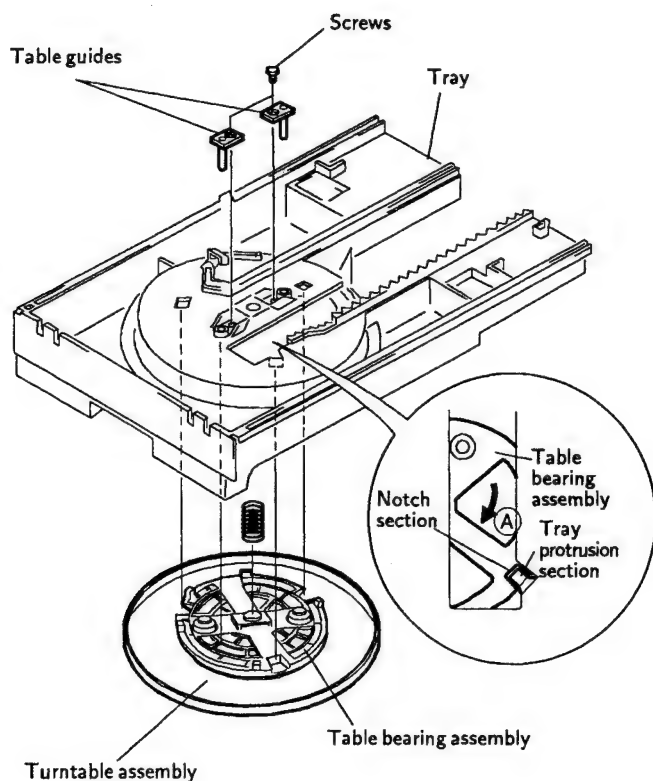
### Float Base Assembly Removal

- ① Remove the tray.
- ② Move the right and left cams in the direction of their respective (A) arrows until the protrusions of the loading base come to the slit opening of the right cam and the left cam.
- ③ Pull up the float base assembly and remove it from the loading base.



### Turntable Assembly Removal

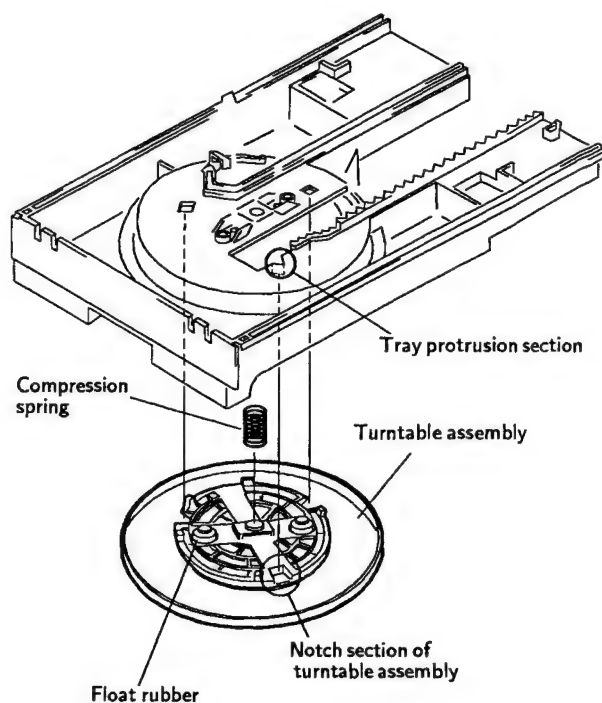
- ① Remove the two screws from the rear of the tray and remove the two table guides.
- ② Turn the table bearing assembly in the direction of the **A** arrow.
- ③ At the position where the tray protrusion is lined up with the table bearing assembly notch (the position shown in the figure), remove the turntable assembly.



## 1.2 ASSEMBLING THE LOADING MECHANISM ASSEMBLY

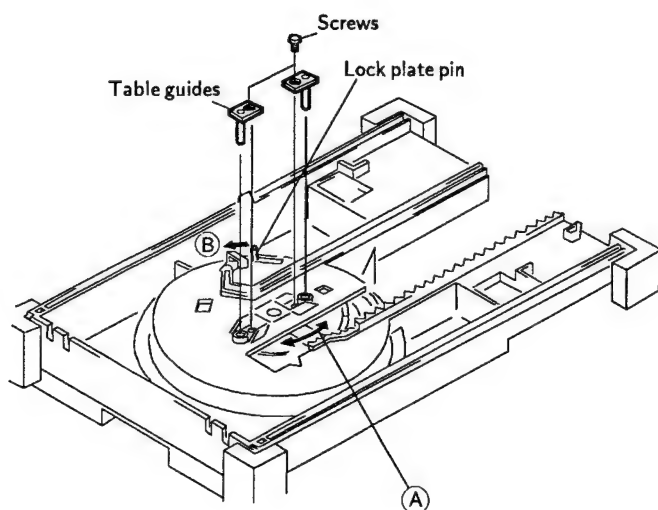
### Assembling the Tray Assembly

- ① Place the turntable assembly upside down and place the compression spring in its center.
- ② Line up the notch section of the turntable assembly with the protrusion section of the tray and assemble.



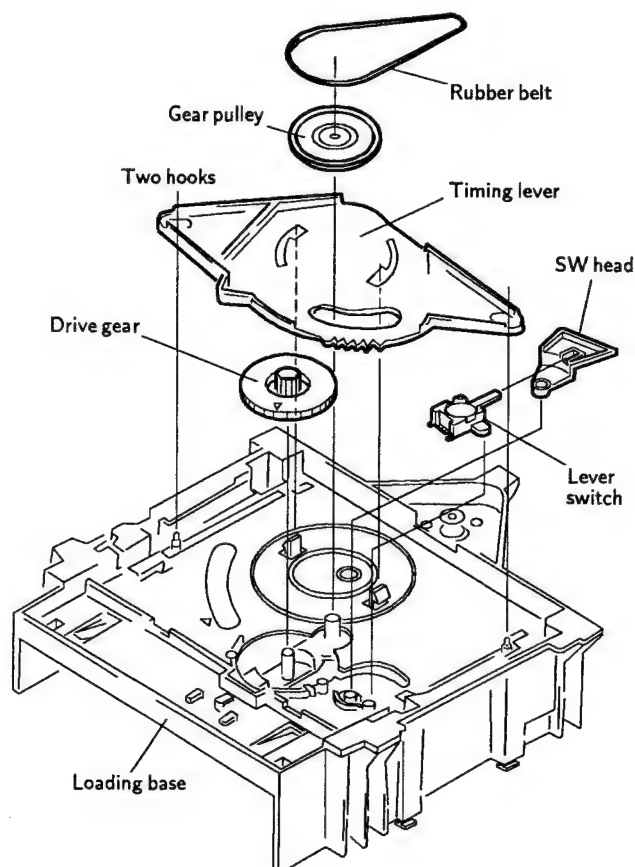
Note: The turntable assembly is to be in the position shown in the figure.

- ③ After assembling the turntable assembly and the tray, turn the lock plate pin somewhat in the direction of the (B) arrow, then hold with your finger.
- ④ While still holding the lock plate pin with your finger, turn the table bearing assembly in the direction of the (A) arrow until the holes in the float rubber piece and in the tray are lined up with each other.
- ⑤ Use the two screws to install the two table guides into the lines up tray and float rubber piece holes.



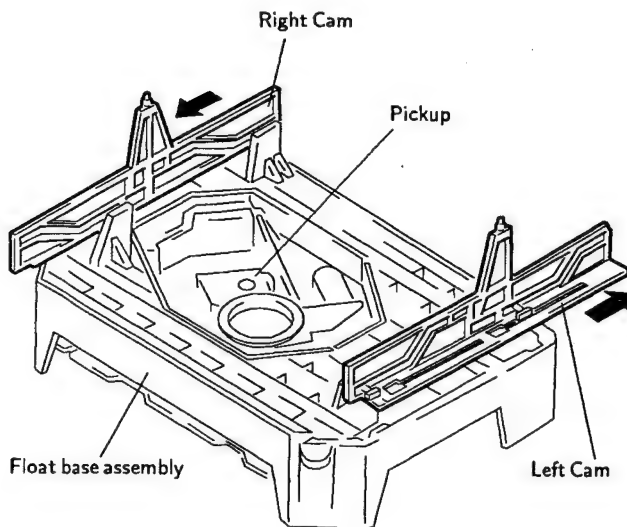
### **Drive Gear, Timing lever, Gear Pulley, Switch Head, and Lever Switch Installation**

- ① Install each part on the loading base as shown in the figure.

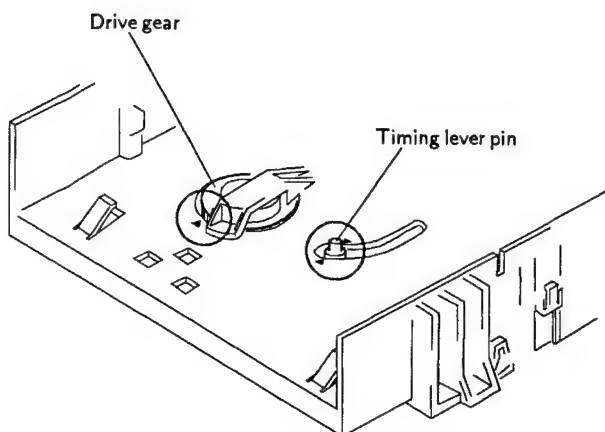


### Loading Base Assembly, Float Base Assembly, Right Cam, and Left Cam Installation

- ① Place the float base assembly upside down (with the pickup facing up).
- ② Install the right cam and the left cam on the float base assembly. Position each cam all the way in the direction of its respective arrow.

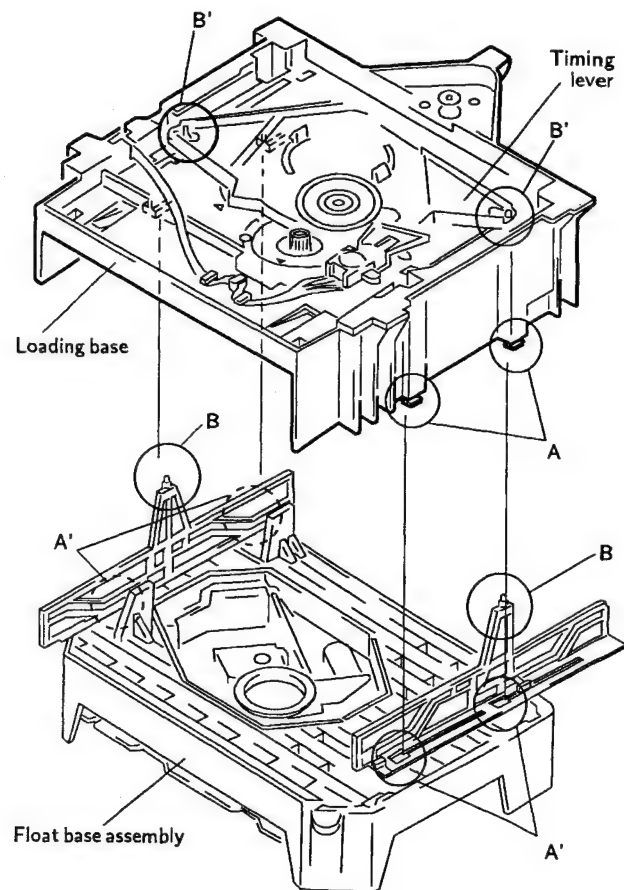


- ③ Line up the  $\Delta$  marks on the drive gear and the loading base as shown in the figure.
- ④ Line up the  $\times$  marks on the loading base and the timing lever pin as shown in the figure.



- ⑤ Next, finely adjust the timing lever angle and the left and right cam position and insert the loading base protrusion A sections (two each on the left and right) into the A' openings on the left and right cam.

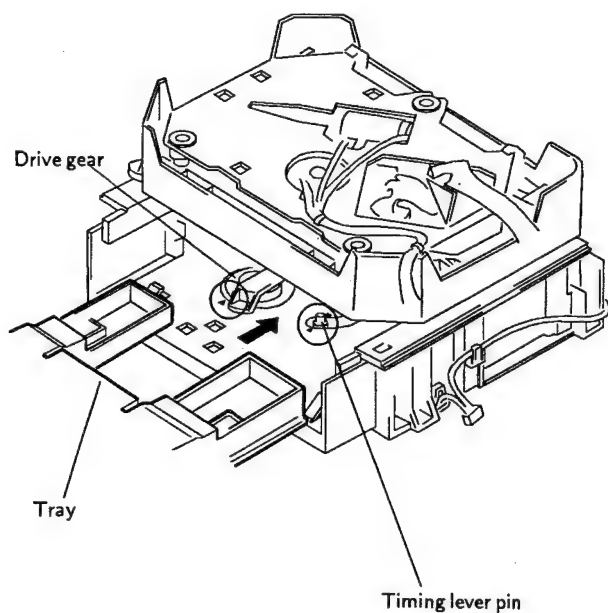
At the same time, pass the protrusion B sections on the left and right cam (one on each cam) through the loading base slit and insert into the B' holes on the timing lever.



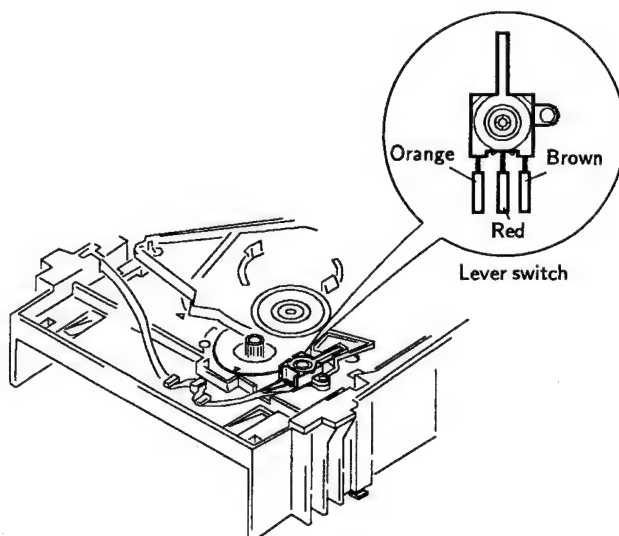
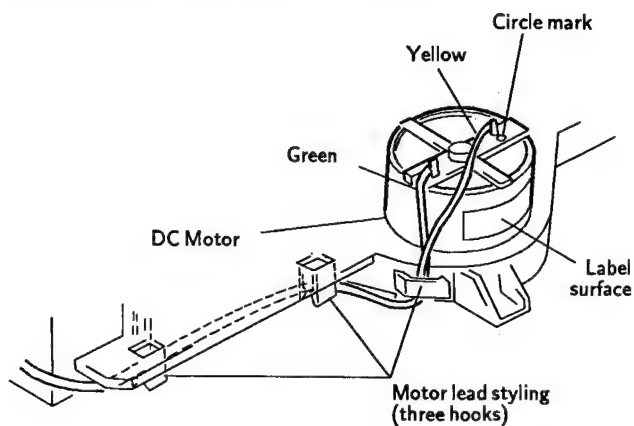


### Tray Installation

- ① Place the parts assembled in the last section upside down.
- ② While being careful not to knock the loading base, drive gear, and timing lever pin aligned in the last section out of place, insert the tray.

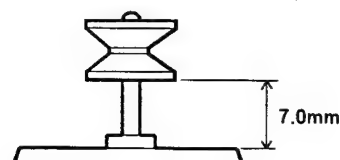


### Motor and Switch Wiring and Styling



### Assembling the Motor Assembly

Set the gap between the motor and pulley to 7.0 mm.



## 2. MECHANISM DESCRIPTION

### 2.1 MECHANISM SUMMARY

#### Summary

This mechanism is a single mechanism assembly with a turntable mounted.

#### Mechanism Sections

This mechanism comprises the loading section and the servo mechanism section.

#### Loading Section

The loading section opens and closes the tray and provides the clamping for the servo mechanism up/down movement. As a new test, this mechanism has a mechanism for decelerating smoothly at the completion of tray take-in in order to make the tray movement look smooth. This done by a spiral shaped drive gear (PNW1996) and the irregularly shaped rack on the tray.

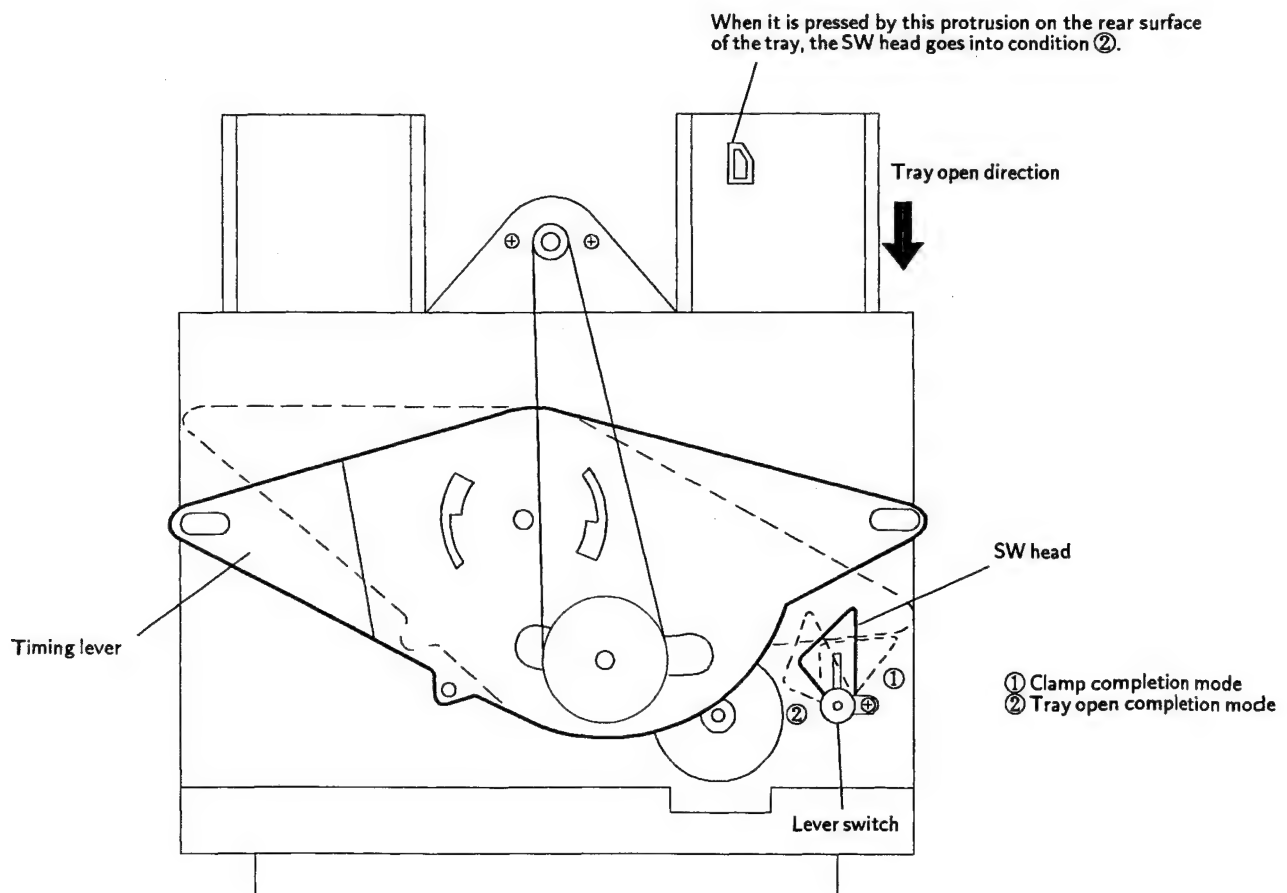
The spring-type clamp quiets the clamping.

#### Servo Mechanism Section

The basic structure of the servo mechanism is about the same as that for a multi-disc type servo mechanism, but the use of the spring-type clamp makes a turntable magnet unnecessary.

The lever switch (DSK1003) and the switch head (PNW1999) are used to detect the completion of tray opening by means of the protrusion on the tray (PNW 2003) rear surface and clamp completion is detected using the timing lever (PNW1997) side wall.

When it is pressed by the protrusion on the rear surface of the tray, the switch head goes into condition ②.



## 2.2 OPERATION SUMMARY

This explanation covers operations sequentially from the disc take-in state to the completion of tray opening.

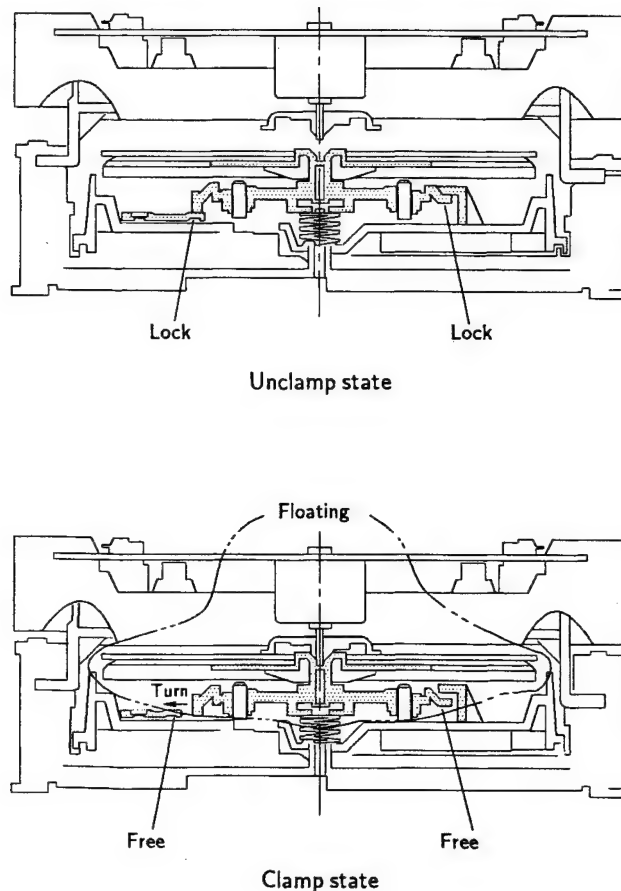
### 1. Clamp Condition

This explanation starts from the tray assembly.

The turntable in the tray assembly always turns freely, but the height of the turntable is locked while the tray is open. This lock is released by the clamping.

This is because while the tray is open, the table bearing that receives the turntable is locked by the lock plate. Just before the completion of tray take-in, the lock plate is turned to release the lock.

Next, we will explain the clamping. When the lock on the table bearing is released, the turntable is supported from below by the float spring. During clamping, the amount of deflection of the spring generates an upward load to provide the clamping force.



### 2. Clamp Release

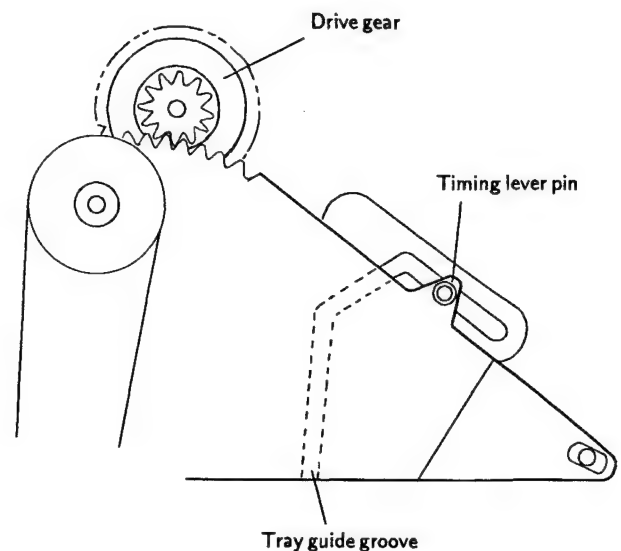
When the timing lever turns, the left and right cams move forward and backward respectively to lift up the float base and release the clamp.

### 3. Tray Operation

The tray and timing lever have rack sections and these rack sections have notch teeth.

Both mesh with the drive gear, but only one tooth meshes at a time, so normally only one of the rack sections is meshed with the drive gear at a time. The rack section pull-in and separation are synchronized with the timing lever pin and the corresponding tray guide groove. When the servo mechanism separates from the turntable, the tray is pushed out by the timing lever pin and the tray rack meshes with the drive gear. The tray is driven by the drive gear and moves forward while turning the timing lever and releasing the meshing with the drive gear.

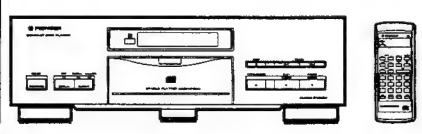
The tray deceleration mechanism mentioned earlier causes the tray to accelerate gradually when it starts to open and causes the tray to decelerate smoothly to the completion of take-in when it closes.



XQ  
373

3377

# Service Manual



ORDER NO.  
**ARP2297**

## COMPACT DISC PLAYER

# PD-41 PD-9700

### PD-41 AND PD-9700 HAVE THE FOLLOWING :

Type	Model		Power Requirement	Remarks
	PD-41	PD-9700		
KU	○	—	AC 120 V only	
KC	—	○	AC 120 V only	
HEM	—	○	AC 220 V-230 V, AC 230 V-240 V (switchable)*	
HB	—	○	AC 220 V-230 V, AC 230 V-240 V (switchable)*	
SD	—	○	AC 110 V, 120 V-127 V, 220 V, 240 V (switchable)	

\* Change the connection of the power transformer's primary wiring.

- This manual is applicable to PD-41/KU, PD-9700/KC, HEM, HB and SD types.
- As to the PD-9700/KC, HEM, HB and SD types, refer to page 84.
- As to the disassembly and mechanism descriptions, refer to the PD-41, PD-9700 service guide(ARP2318).
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

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3377

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

#### WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

## 1. SAFETY INFORMATION

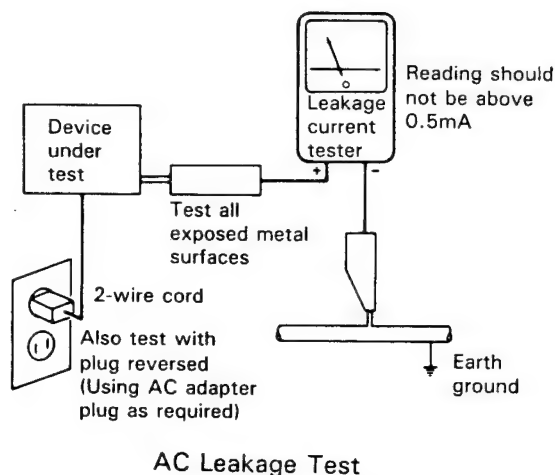
(FOR USA MODEL ONLY)

### 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

#### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!

AVATTAESSA JA SUOJALUKITUS  
OHITETTAESSA OLET ALTTIINA  
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.  
ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:

USYNLIG LASERSTRÅLING VED ÅBNING  
NÅR SIKKERHEDSAFBRYDERE ER UDE AF  
FUNKTION UNDGÅ UDSÆTTELSE FOR  
STRÅLING.

WARNING!

OSYNLIG LASERSTRÅLNING NÅR DENNA  
DEL ÄR ÖPPNAD OCH SPÄRREN  
ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.



LASER  
Kuva 1  
Lasersäteilyn  
varoituserkki

WARNING!

DEVICE INCLUDES LASER DIODE WHICH  
EMITS INVISIBLE INFRARED RADIATION  
WHICH IS DANGEROUS TO EYES. THERE IS  
A WARNING SIGN ACCORDING TO PICTURE  
1 INSIDE THE DEVICE CLOSE TO THE LASER  
DIODE.



LASER  
Picture 1  
Warning sign for  
laser radiation

IMPORTANT

THIS PIONEER APPARATUS CONTAINS  
LASER OF HIGHER CLASS THAN 1.  
SERVICING OPERATION OF THE APPARATUS  
SHOULD BE DONE BY A SPECIALLY  
INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS

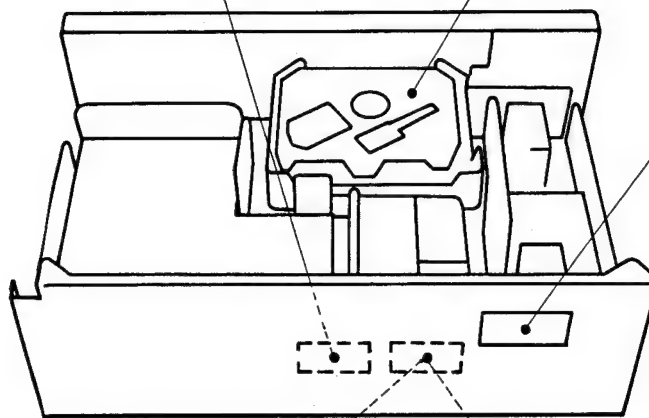
MAXIMUM OUTPUT POWER: 5 mw  
WAVELENGTH: 780-785 nm

LABEL CHECK

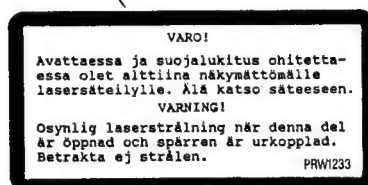
HEM type



HEM and HB types



HB type



HEM type

Additional Laser Caution

1. Laser Interlock Mechanism

The position of the switch (S 601) for the detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S 601) is not in CLMP terminal side (when the mechanism is not clamped and CLMP signal is high level).

Thus, the interlock will no longer function if the switch (S 601) is deliberately set to CLMP terminal side (if CLMP signal is low level).

In the test mode, the interlock mechanism will not function (refer to page 36).

Laser diode oscillation will continue if pins 2 and 3 of CXA 1471 S (IC 101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q 101 are shorted to each other (fault condition).

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.



## 2. EXPLODED VIEWS AND PARTS LIST

### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

### 2.1 EXTERIOR

#### Parts List of Exterior

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
⚠●	1	Analog board assembly	PWM1490	⚠●	41	Bonnet case	PYY1071
⚠	2	Strain relief	CM-22C	⚠●	42	Main board assembly	PWZ2150
	3	33P F.F.C/30V	PDD1094	●	43	Function A board assembly	PWZ2168
⚠	4	AC power cord	PDG1015		44	Badge	
⚠	5	Power transformer	PTT1166		45	Front panel	
⚠	6	Power transformer	PTT1206		46	Function B board assembly	
	7	Washer	ABE1009		47	Primary board assembly	
	8	Stopper	PNM1095		48	Rubber sheet	
	9	Tape	PNM1099		49	Switch angle	
	10	Stopper	PNM1107		50	Spacer	
	11	Cord clasper(steel)	RNH-184		51	L angle	
	12	Button	PAC1530		52	Sheet	
	13	Power button	PAC1539		53	Tape	
	14	Control button	PAC1609		54	Side angle	
	15	FL sheet	PAM1514		55	PCB angle	
	16	Display window	PAM1515		56	Under base	
	17	LED cover	PEB1150		57	Base	
	18	LED cover (S)	PEB1167		58	Rear base	
	19	Side rubber	PEB1180		59	Binder holder	
	20	Tray panel	PNW1815		60	PCB spacer	
	21	Lens L	PNW1860		61	Angle B	
	22	Indicator lens	PNW1893		62	Shield angle	
	23	Tray lens	PNW1950		63	Shield plate	
	24	Control panel	PNW2066				
	25	. . . . .					
	26	Screw	BBT30P080FCC				
	27	Screw	BBZ26P080FCC				
	28	Screw	BBZ30P080FCC				
	29	Screw	BBZ30P080FCC				
	30	Screw	BBZ30P140FCC				
	31	Screw	BBZ40P060FCC				
	32	Screw	BBZ40P080FZK				
	33	Screw	FBT40P080FZK				
	34	Screw	IBZ30P060FCC				
	35	Screw	IBZ30P150FCC				
	36	Screw	IBZ30P180FCC				
	37	Screw	PDZ30P050FCC				
	38	Screw	PMZ30P060FCC				
	39	Washer	WH40FUC				
	40	Front panel assembly	PEA1167				

A

B

C

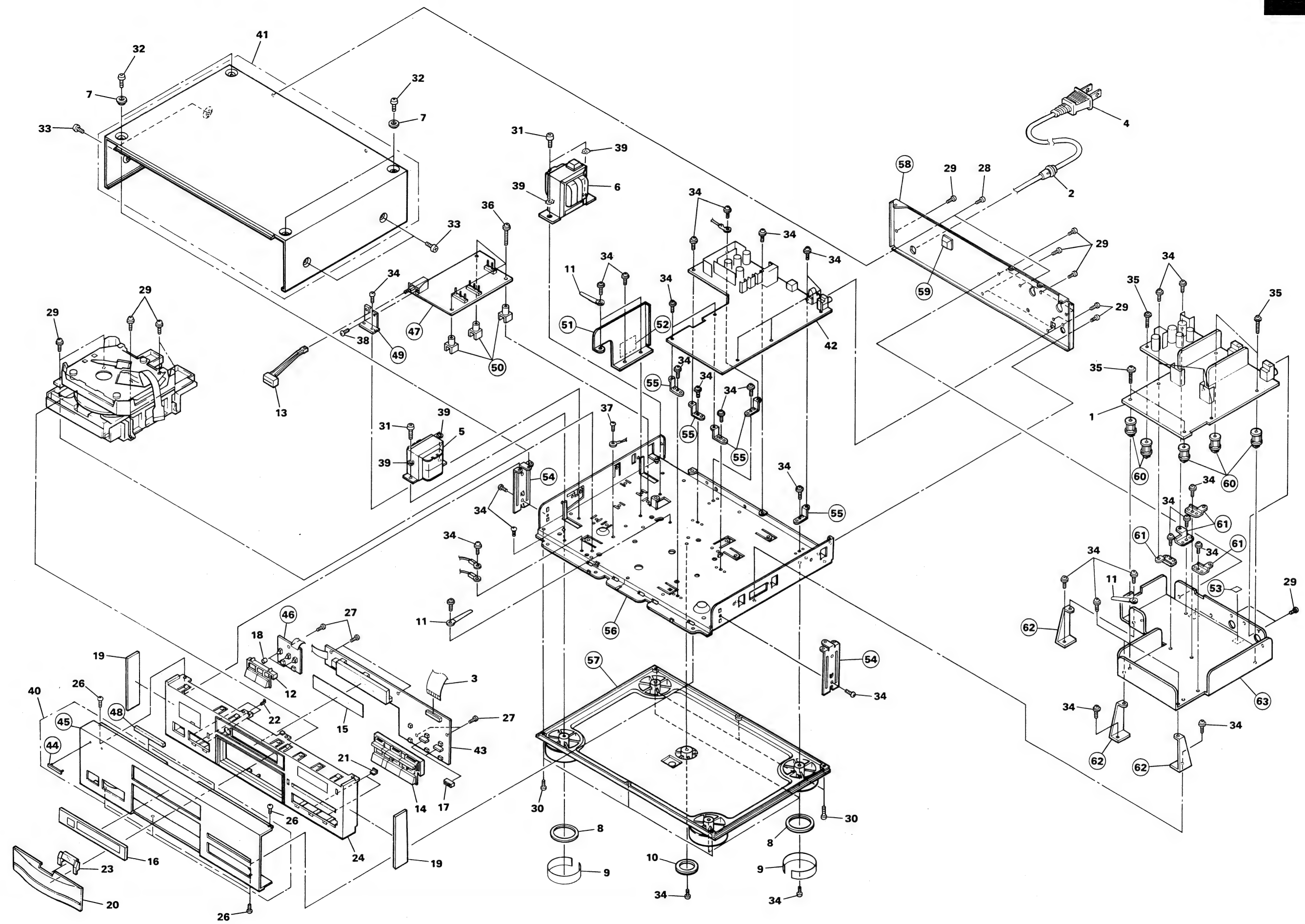
D

A

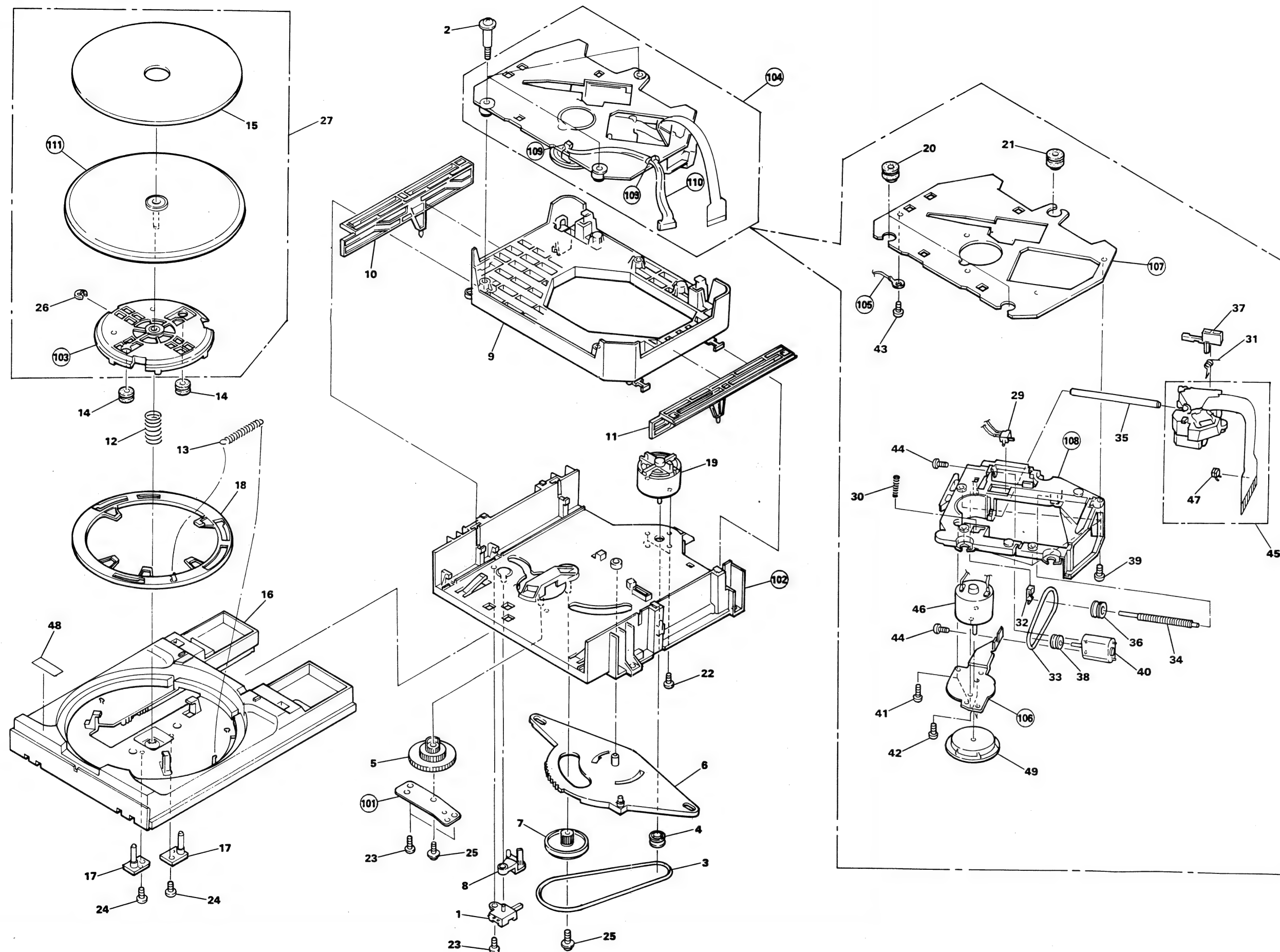
B

C

D



2.2 MECHANISM SECTION



FUNCTION A BOARD ASSEMBLY  
(PWZ2168:KU AND KC TYPES)  
(PWZ2169:HEM,SD AND HB TYPES)

X2	
KU, KC	33pins
HB, HEM, SD	31pins

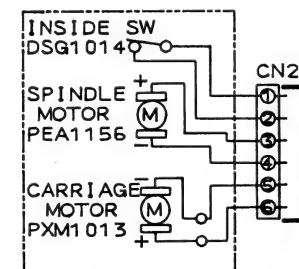
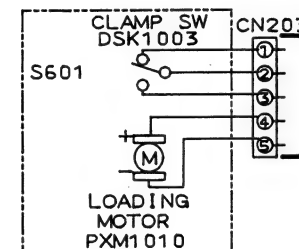
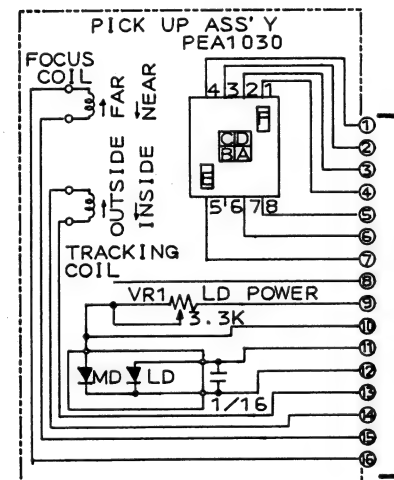
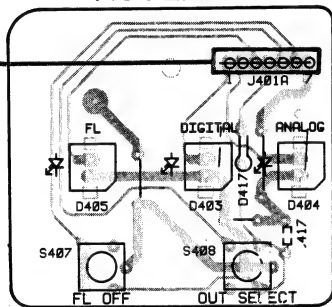
KU AND KC  
TYPES ONLY

IC301 (CXD2500AQ)			
Pin No.	Voltage	Pin No.	Voltage
1	5	41	2.5
2	2.1	42	5
3	5	43	2.5
4	2.6	44	0
5	2.2	45	5
6	5	46	4.4
7	0	47	0
8	5	48	0
9	0	49	0~0.3
10	0	50	1.2
11	2.1	51	1.2
12	0	52	0
13	1.0	53	2.5
14	0.9~1.3	54	2.5
15	0	55	0
16	2.0	56	2.9
17	0	57	2.5
18	2.5	58	5
19	2.4	59	5
20	2.4	60	2.5
21	0	61	0
22	2.5	62	2.5
23	5	63	0
24	2.5	64	0
25	0.2	65	0
26	0	66	3.3~4.6
27	2.5	67	5
28	0	68	0
29	0	69	2.1~3
30	0	70	5
31	1.3~2.2	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	2.5	76	0
37	2.5	77	5
38	2.5	78	5
39	0	79	5
40	5	80	0

IC151 (CXA1372S)			
Pin No.	Voltage	Pin No.	Voltage
1	0	25	-5
2	0	26	5
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	1	35	0
12	0	36	-5
13	0.2	37	2.5
14	0	38	2.5
15	0	39	5
16	5	40	-1.5
17	0	41	-1.7
18	0	42	5
19	0	43	-0.7
20	0.2~0.8	44	-1.6
21	0	45	0
22	-4	46	0.8
23	1.3	47	-5
24	0	48	0

IC401 (PD4329A)							
Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	-24~-24.3	17	-1	33	5	49	5
2	-24~-24.3	18	-2.6	34	3.3~4.7	50	5
3	-24~-24.3	19	-5	35	5	51	0
4	-24~-24.3	20	-17.6~-17.8	36	0	52	5
5	-24~-24.3	21	-1.6	37	5	53	5
6	-24~-24.3	22	-12.5~-15.5	38	5	54	5
7	-24~-24.3	23	-3.4~-6.4	39	0	55	5
8	-24~-24.3	24	-4~-7	40	0	56	2.5
9	-24~-24.3	25	-6.8~-9.8	41	0	57	2.5
10	-24~-24.3	26	5	42	0	58	0
11	-24~-24.3	27	-1.5	43	5	59	0
12	0	28	-1.2~-1.6	44	5	60	5
13	5	29	-12.5~-15.4	45	0	61	0
14	0	30	-12.1~-17.6	46	5	62	0
15	4.9	31	4	47	5	63	0
16	-27.5~-27.8	32	5	48	2.1~3	64	0

FUNCTION B BOARD ASSEMBLY



Line Voltage Selection (For HEM and HB types)

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

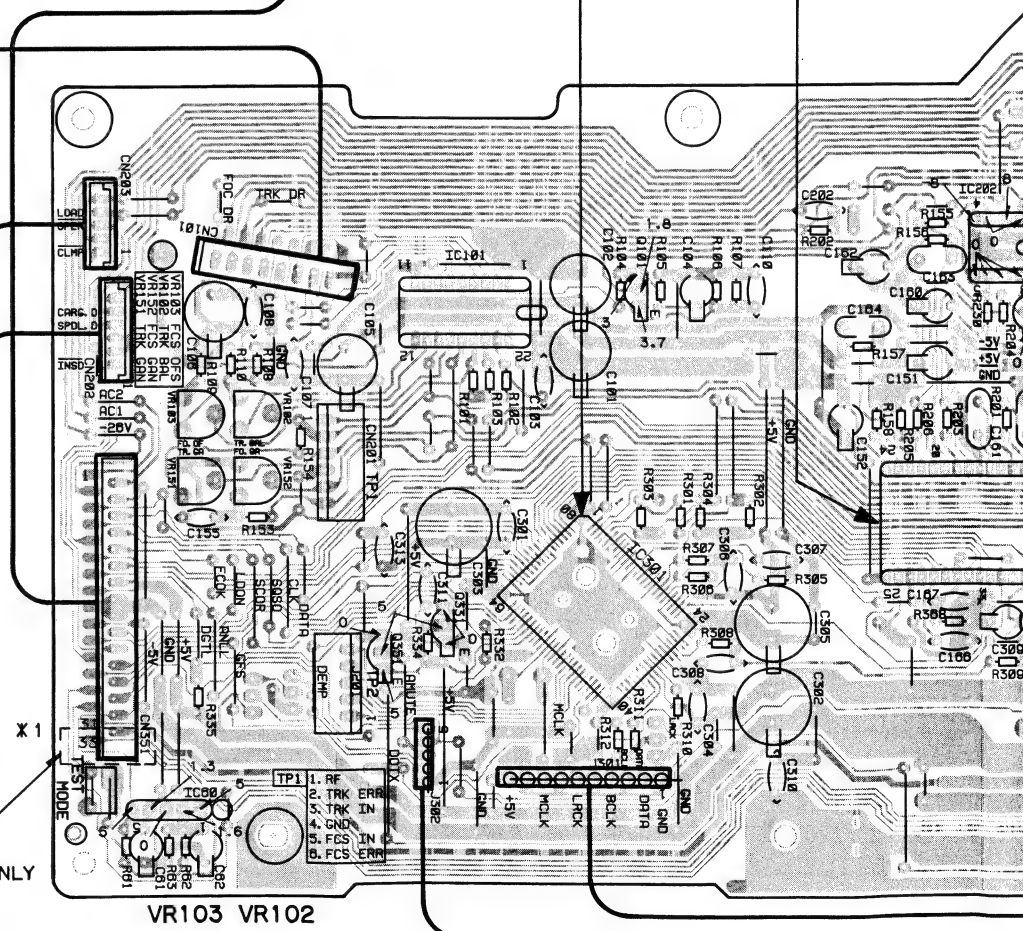
Voltage	Jumper wire A position
220 V-230 V	a
230 V-240 V	b

4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220 V label
AXX-192	240 V label

X1	
KU, KC	33pins
HB, HEM, SD	31pins

KU AND KC TYPES ONLY

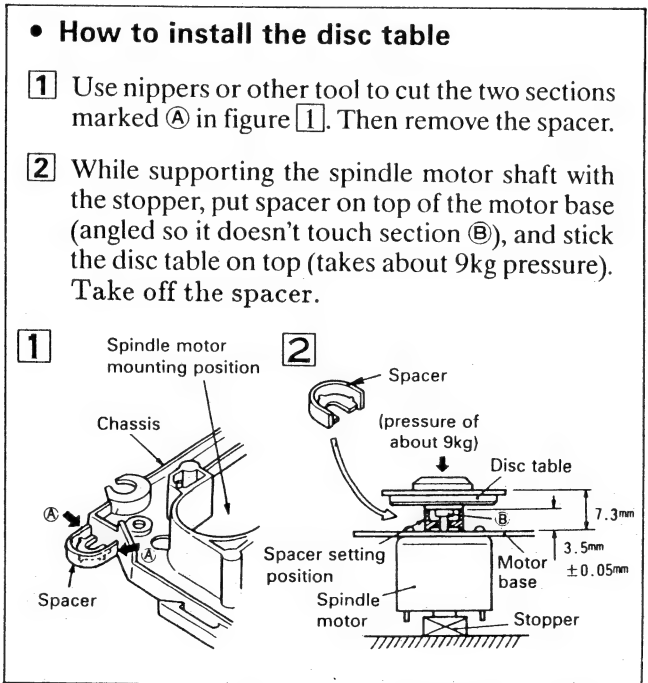


Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Voltage	5	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-24~-24.3	-27.5~-27.8
Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Voltage	-1	-26	-5	-17.6~-17.8	-1.6	-12.5~-15.5	-3.4~-6.4	-4~-7	-6.8~-9.8	5	-1.5	-1.2~-1.6	-12.5~-15.4	-12.1~-17.6	4	5
Pin No.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Voltage	5	3.3~4.7	5	0	5	5	0	0	0	0	5	5	0	5	5	2.1~3
Pin No.	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Voltage	5	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4

IC401 (PD4329A)

### Parts List of Mechanism section

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	1	Lever switch	DSK1003		101	Shaft holder	
	2	Screw(steel)	PBA1027		102	Loading base	
	3	Rubber belt	PEB1186		103	Table bearings assembly	
	4	Motor pulley	PNW1634		104	Servo mechanism assembly	
	5	Drive gear	PNW1996		105	Earth lead unit(300V)	
	6	Timing lever	PNW1997		106	Motor base	
	7	Gear pulley	PNW1998		107	Mechanism base	
	8	SW head	PNW1999		108	Mechanism chassis	
	9	Float base	PNW2000		109	Clamper	
	10	Left cam	PNW2001		110	Connector assembly	
	11	Right cam	PNW2002		111	Turn table(AL)	
	12	Compression spring	PBH1120				
	13	Tention spring	PBH1121				
	14	Float(rubber)	PEB1014				
	15	Table rubber sheet	PEB1169				
	16	Tray	PNW2003				
	17	Table guide	PNW2004				
	18	Lock plate	PNW2005				
	19	DC motor(0.75W)	PXM1010				
	20	Rubber bush	PEB1031				
	21	Rubber bush	PEB1170				
	22	Screw	BMZ26P040FMC				
	23	Screw	BPZ26P060FMC				
	24	Screw	BPZ26P060FMC				
	25	Screw	IPZ20P080FMC				
	26	Stop ring	YE20S				
	27	Turn table assembly	PEA1157				
	29	Push switch	DSG1014				
	30	Spring	PBH1009				
	31	Speing	PBH1084				
	32	Plate spring	PBK1057				
	33	Belt(square)	PEB1072				
	34	Screw	PLA1003				
	35	Guide bar	PLA1071				
	36	Pulley	PNW1066				
	37	Half nut	PNW1605				
	38	Motor pulley	PNW1634				
	39	Screw	PBZ30P080FMC				
	40	DC motor(1.7W)	PXM1013				
	41	Screw	BPZ20P080FZK				
	42	Screw	JFZ20P025FMC				
	43	Screw	PBZ30P060FMC				
	44	Screw	PMZ20P030FMC				
	45	Pick up assembly	PEA1030				
	46	DC motor assembly(With oil)	PEA1156				
	47	Semi-fixed VR(3.3K)	PCP1008				
	48	Caution label	PRW1244				
	49	Disc table	PNW1067				



### 2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shows, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the fingers.(Figs . 1 and 2)

### 2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both ends of the tray while holding the tray lens with your fingers, then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4, and slide them down till you hear a click sound while pressing them strongly with your thumbs. (Figs. 4 and 5)

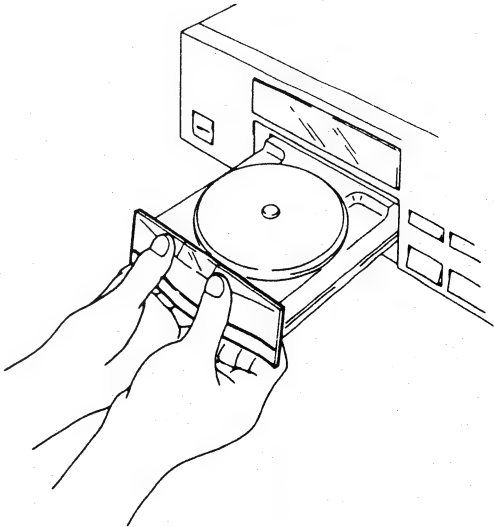


Fig. 4



•TERMINAL VOLTAGES

Pin No.	1	2	3	4	5	6	7	8	9	10	11
Voltage	0	2.9	-4.7	0	0	-5	0	0	0	0	0
Pin No.	12	13	14	15	16	17	18	19	20	21	22
Voltage	0	-0.9	1.3	0	0	0	0	0	0	2.1	2.2
Pin No.	23	24	25	26	27	28	29	30	31	32	33
Voltage	0	0	0	0.2~0.8	0	0	0.2	0	0	0	0

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pin No.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pin No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pin No.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. PACKING

Mark	No.	Description	Parts No.
	1	Cord with plug(mini plug)	PDE-319
	2	Cord with plug	PDE1001
	3	Operating instructions (English, French)	PRE1149
	4	Remote control unit(CU-PD054)	PWW1058
	5	Battery cover	PZN1001
	6	Polyethelene bag	Z21-038
	7	Protector F	PHA1145
	8	Protector R	PHA1146
	9	CD packing case	PHG1677
	10	Sheet	VHL-037
	11	Label	PRW1253

101 Battery (R03, AAA)

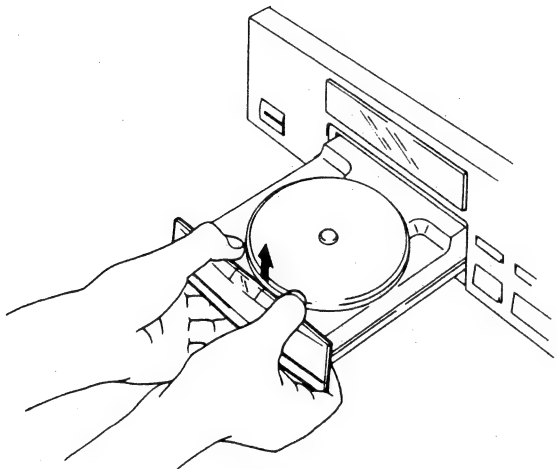


Fig. 1

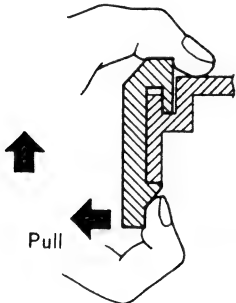


Fig. 2

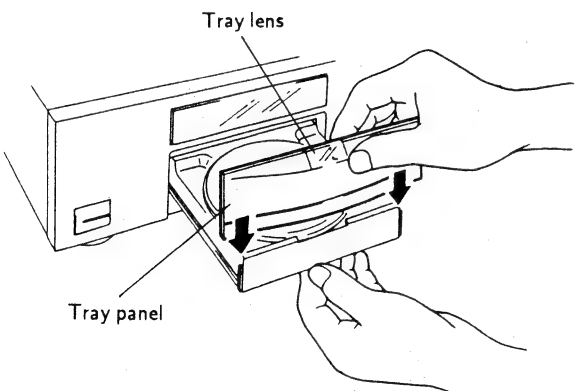


Fig. 3

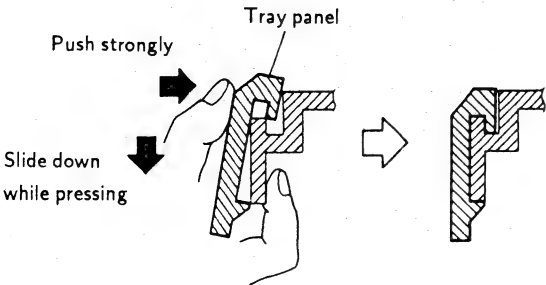
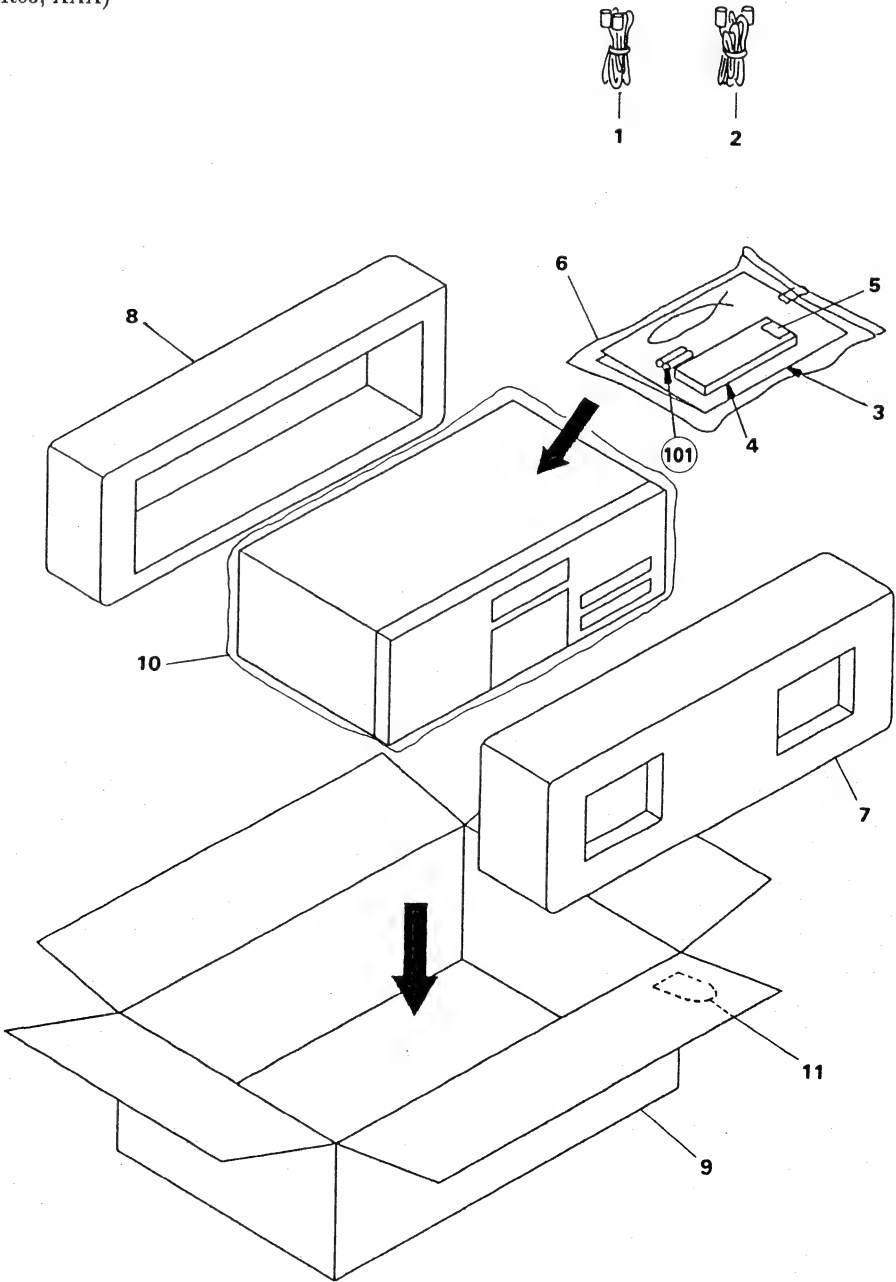
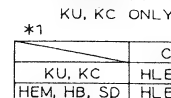


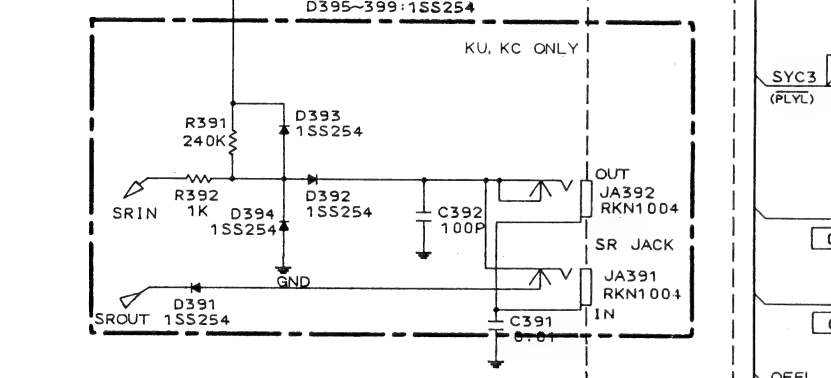
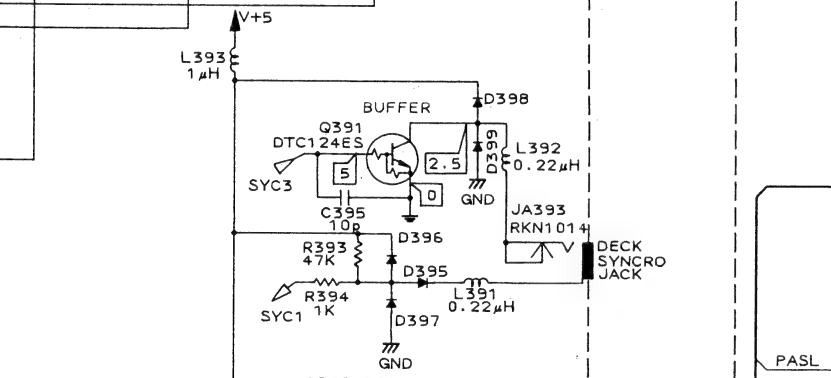
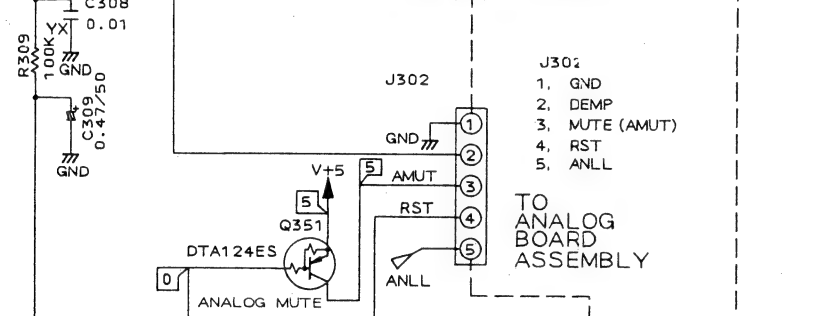
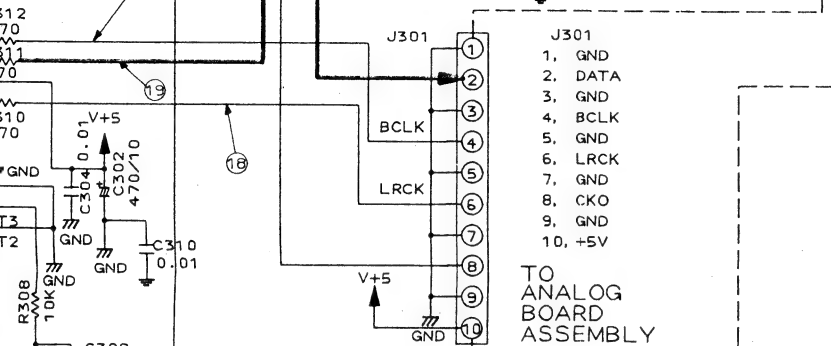
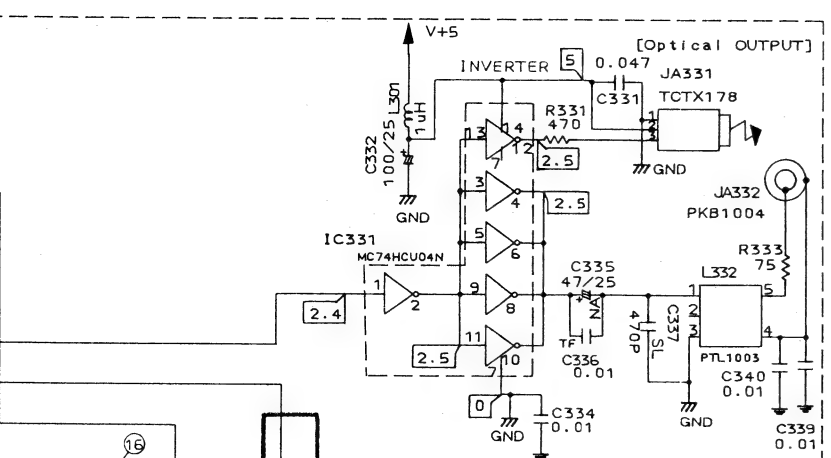
Fig. 5



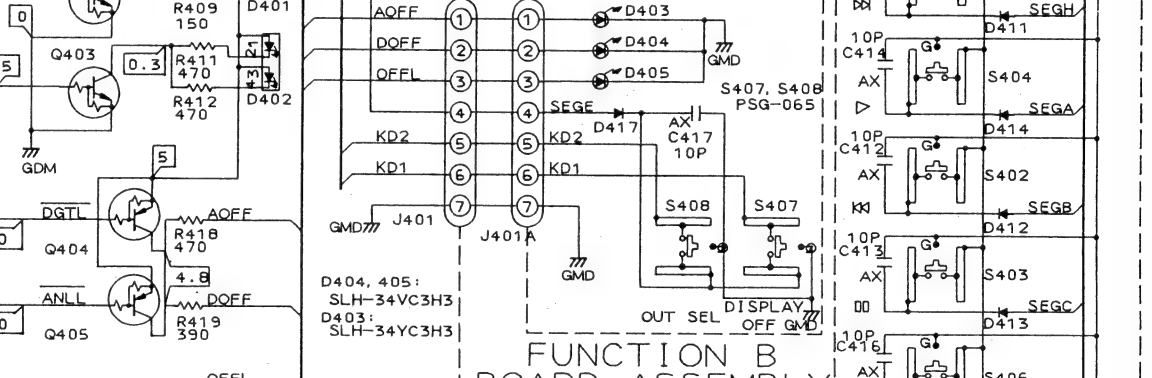
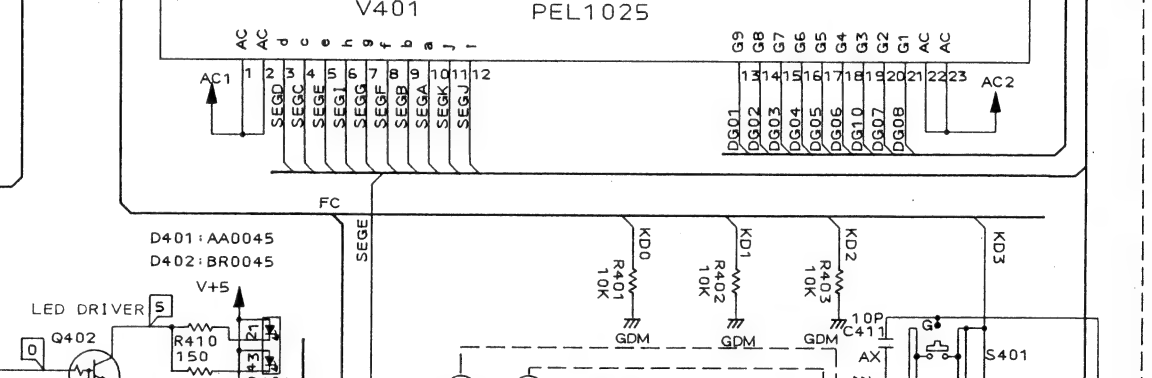
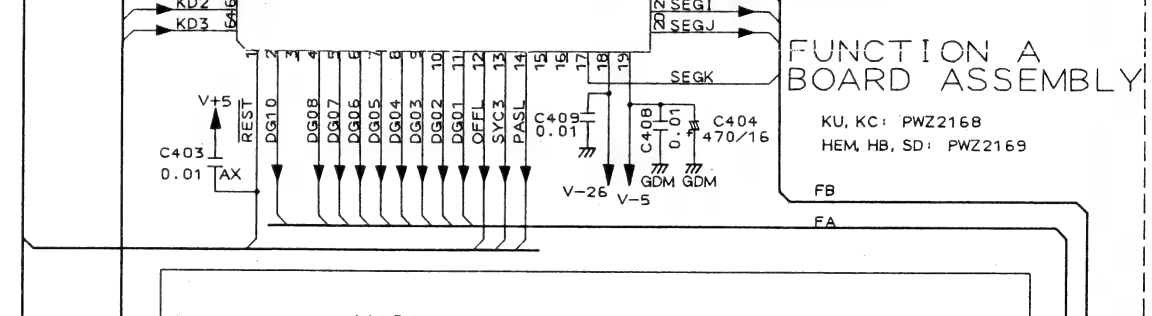
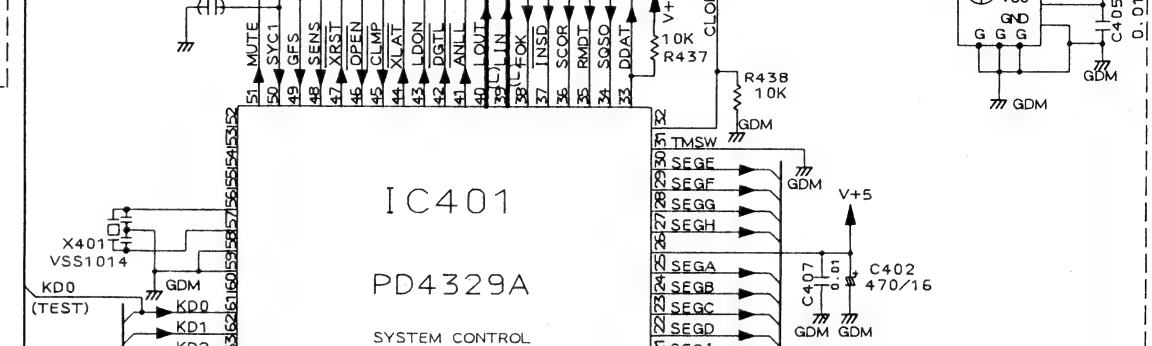
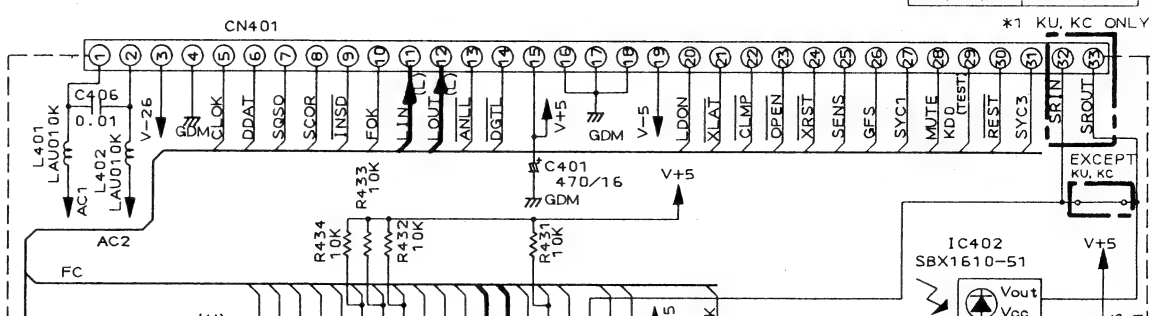
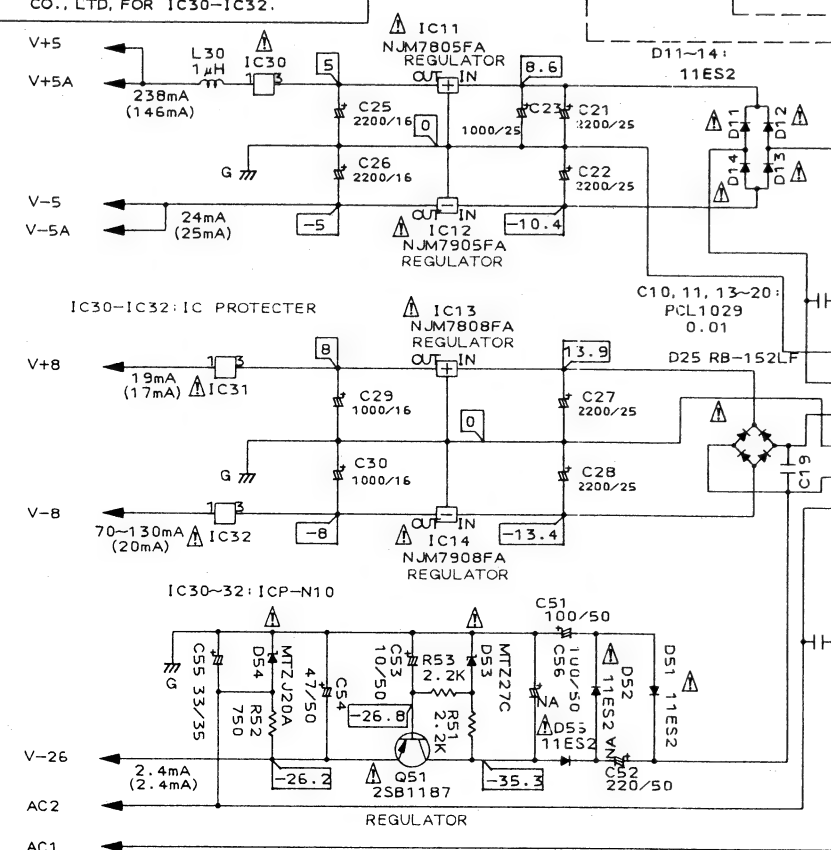
#### 4.1 MAIN BOARD(PWZ 2150), PRIMARY BOARD, FUNCTION A BOARD(PWZ 2168), AND FUNCTION B BOARD ASSEMBLIES



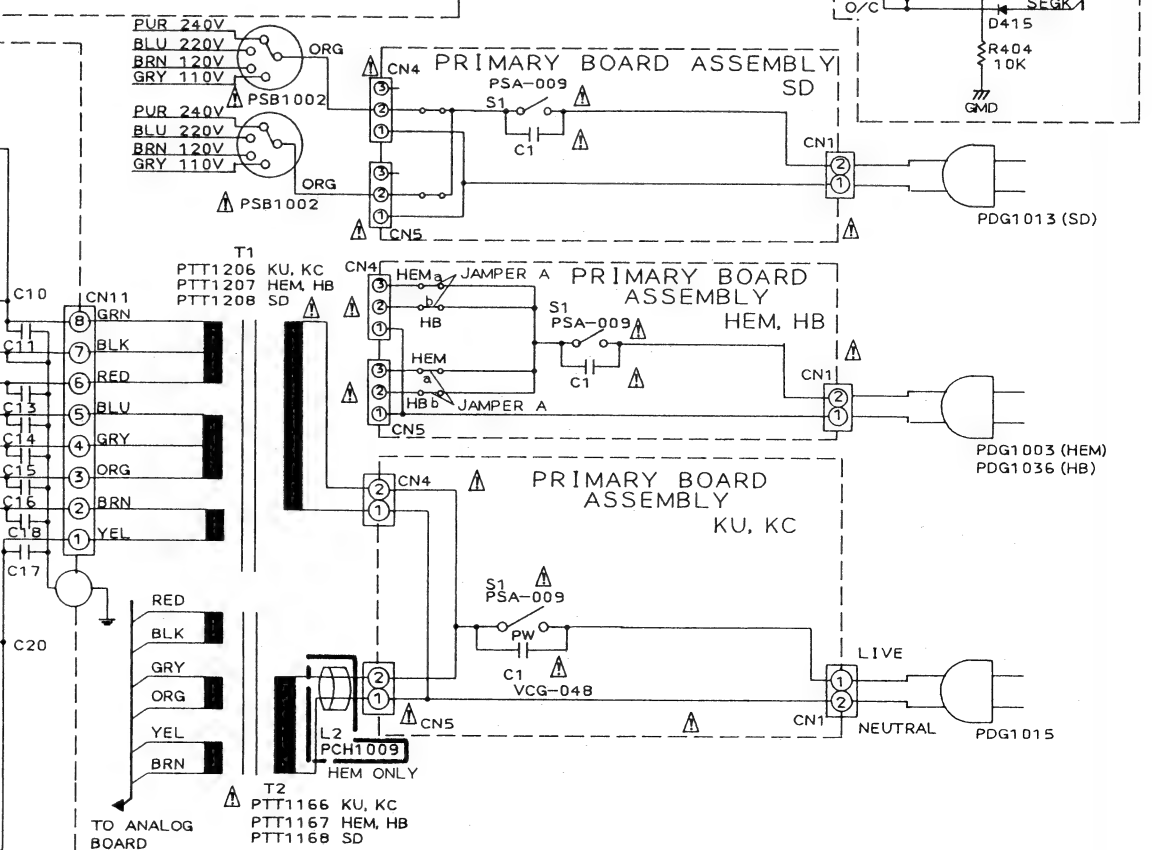




FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE NO. ICP-N10, MFD BY ROHM CO., LTD, FOR IC30-IC32.



FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE NO. ICP-N10, MFD BY ROHM CO., LTD, FOR IC30-IC32.



A

B

C

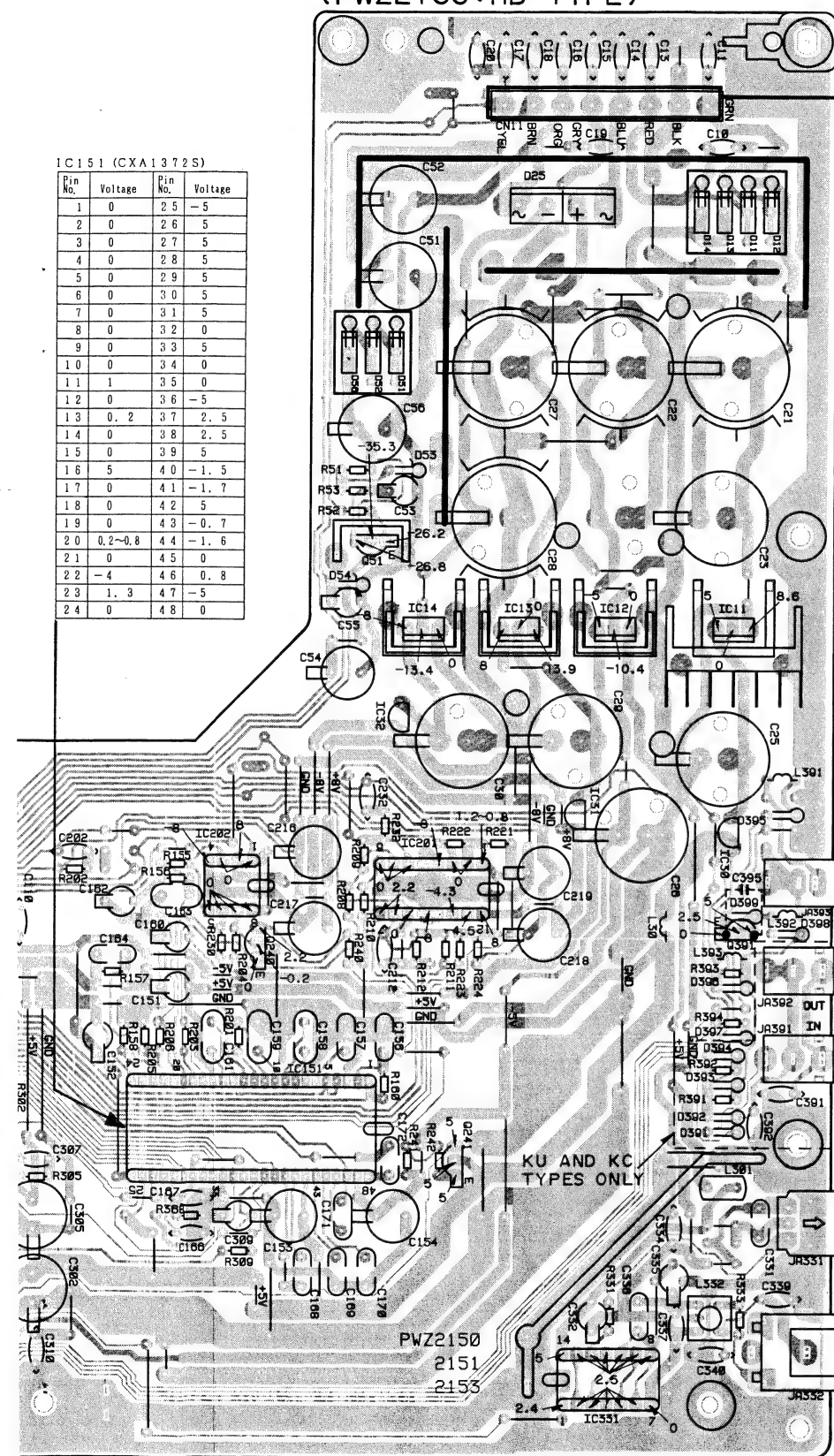
D

E

F

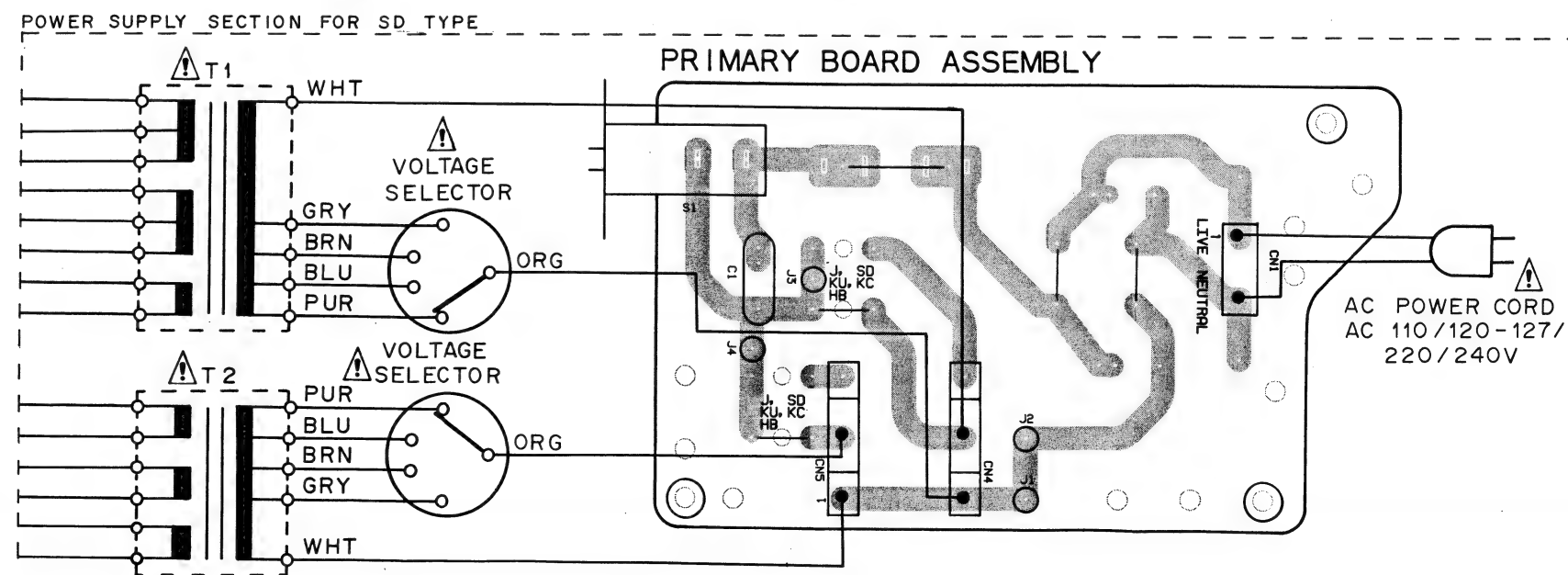
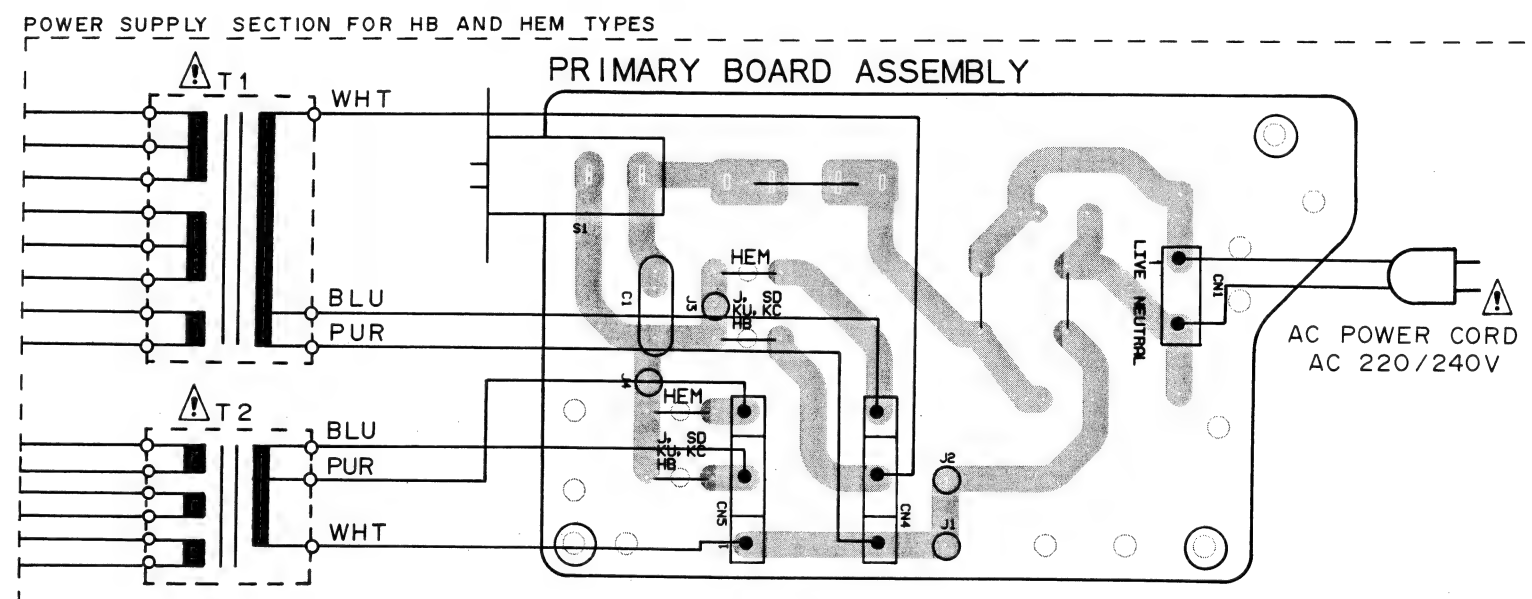
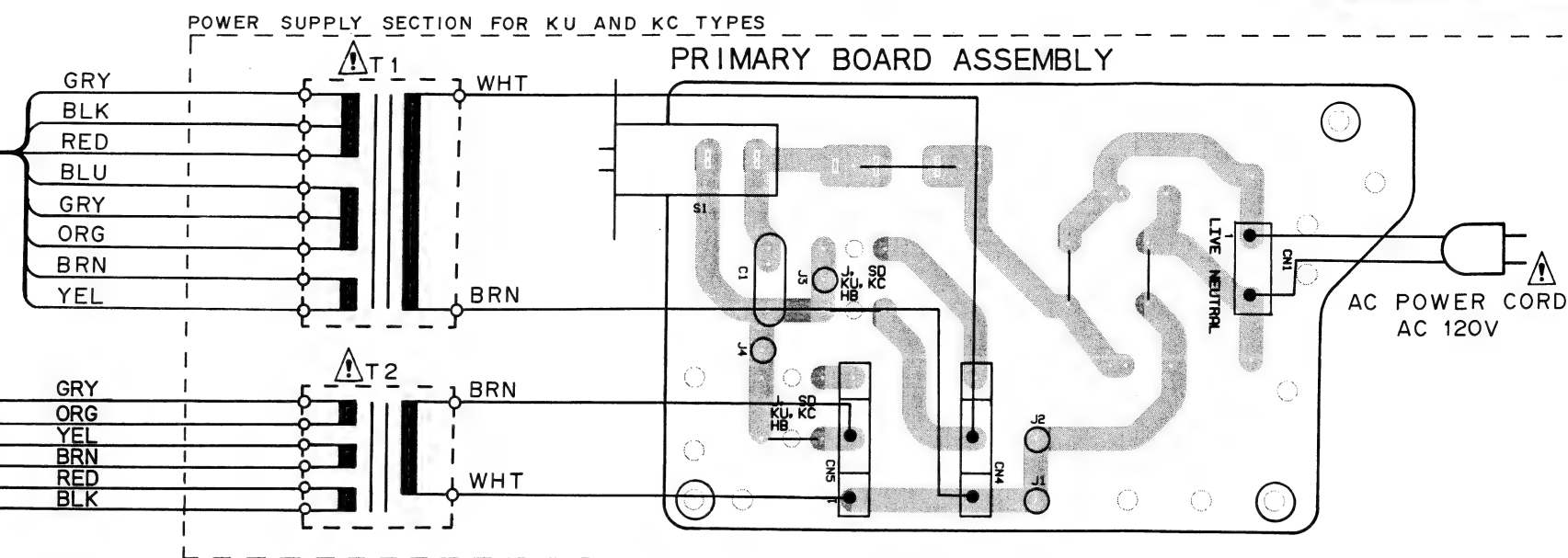


IC151 (CXA1372S)			
Pin No.	Voltage	Pin No.	Voltage
1	0	2	-5
2	0	2.6	5
3	0	2.7	5
4	0	2.8	5
5	0	2.9	5
6	0	3.0	5
7	0	3.1	5
8	0	3.2	0
9	0	3.3	5
10	0	3.4	0
11	1	3.5	0
12	0	3.6	-5
13	0, 2	3.7	2, 5
14	0	3.8	2, 5
15	0	3.9	5
16	5	4.0	-1, 5
17	0	4.1	-1, 7
18	0	4.2	5
19	0	4.3	-0, 7
20	0.2~0.8	4.4	-1, 6
21	0	4.5	0
22	-4	4.6	0, 8
23	1, 3	4.7	-5
24	0	4.8	0



IC202	Q240	IC151	IC201	IC31	IC331	IC30
		Q51	IC32	Q241		Q391
			IC14	IC13	IC12	IC11

TO  
ANALOG  
BOARD  
ASSEMBLY



A

**B**

C

D

Pin No.	Pin Voltage	Pin Voltage	Pin Voltage
1	0	5	0
2	0	6	0
3	0	7	0
4	0	8	0
5	0	9	0
6	0	10	0
7	0	11	0
8	0	12	0
9	0	13	0
10	0	14	0
11	0	15	0
12	0	16	0
13	0	17	0
14	0	18	0
15	0	19	0
16	0	20	0
17	0	21	0
18	0	22	0
19	0	23	0
20	0	24	0
21	0	25	0
22	0	26	0
23	0	27	0
24	0	28	0
25	0	29	0
26	0	30	0
27	0	31	0
28	0	32	0
29	0	33	0
30	0	34	0
31	0	35	0
32	0	36	0
33	0	37	0
34	0	38	0
35	0	39	0
36	0	40	0
37	0	41	0
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299	0	303	0
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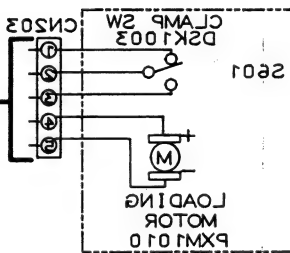
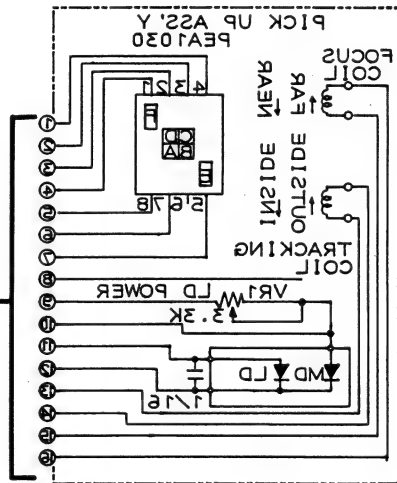
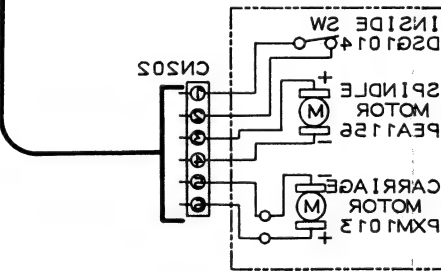
This P.C.B. connection diagram is viewed from the foil side.

HB'HEM'2D	34pins
KU' KC	33pins
CN381	

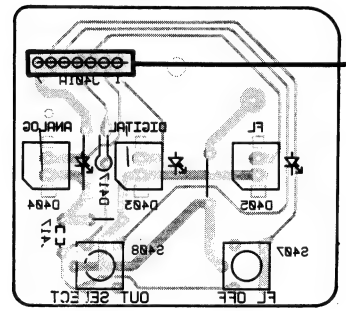
KU AND KC TYPES ONLY

VR151 VR152  
VR103 VR105

IC101 IC301 IC302 IC303 IC304 IC401 IC402 IC403 IC404 IC405



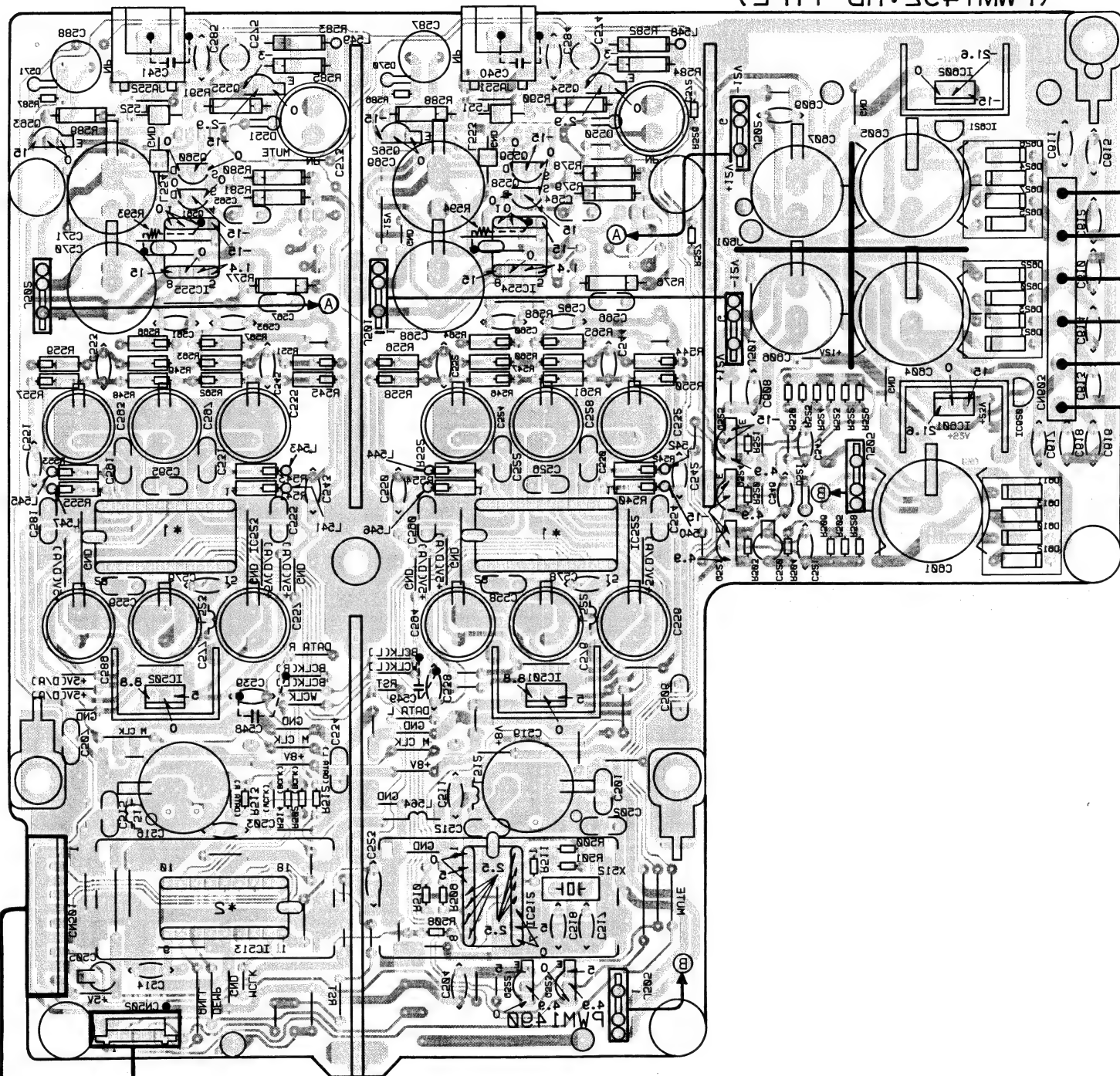
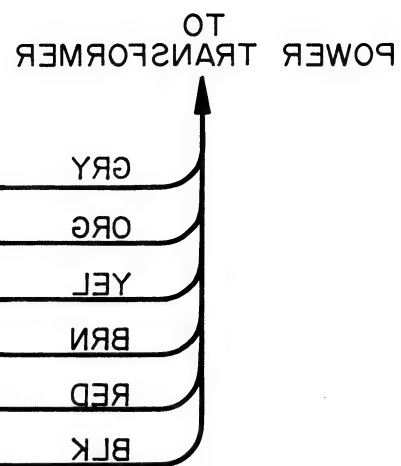
### FUNCTION B BOARD ASSEMBLY



### (PW25168:HEM.2D AND HB TYPES) FUNCTION A BOARD ASSEMBLY (PW25168:KU AND KC TYPES)

Pin No.	Pin Voltage	Pin No.	Pin Voltage
1	5V	16	5V
2	5V	17	5V
3	5V	18	5V
4	5V	19	5V
5	5V	20	5V
6	5V	21	5V
7	5V	22	5V
8	5V	23	5V
9	5V	24	5V
10	5V	25	5V
11	5V	26	5V
12	5V	27	5V
13	5V	28	5V
14	5V	29	5V
15	5V	30	5V
16	5V	31	5V
17	5V	32	5V
18	5V	33	5V
19	5V	34	5V
20	5V	35	5V
21	5V	36	5V
22	5V	37	5V
23	5V	38	5V
24	5V	39	5V
25	5V	40	5V
26	5V	41	5V
27	5V	42	5V
28	5V	43	5V
29	5V	44	5V
30	5V	45	5V
31	5V	46	5V
32	5V	47	5V
33	5V	48	5V
34	5V	49	5V
35	5V	50	5V
36	5V	51	5V
37	5V	52	5V
38	5V	53	5V
39	5V	54	5V
40	5V	55	5V
41	5V	56	5V
42	5V	57	5V
43	5V	58	5V
44	5V	59	5V
45	5V	60	5V
46	5V	61	5V
47	5V	62	5V
48	5V	63	5V
49	5V	64	5V
50	5V	65	5V
51	5V	66	5V
52	5V	67	5V
53	5V	68	5V
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55	5V	70	5V
56	5V	71	5V
57	5V	72	5V
58	5V	73	5V
59	5V	74	5V
60	5V	75	5V
61	5V	76	5V
62	5V	77	5V
63	5V	78	5V
64	5V	79	5V
65	5V	80	5V
66	5V	81	5V
67	5V	82	5V
68	5V	83	5V
69	5V	84	5V
70	5V	85	5V
71	5V	86	5V
72	5V	87	5V
73	5V	88	5V
74	5V	89	5V
75	5V	90	5V
76	5V	91	5V
77	5V	92	5V
78	5V	93	5V
79	5V	94	5V
80	5V	95	5V
81	5V	96	5V
82	5V	97	5V
83	5V	98	5V
84	5V	99	5V
85	5V	100	5V
86	5V	101	5V
87	5V	102	5V
88	5V	103	5V
89	5V	104	5V
90	5V	105	5V
91	5V	106	5V
92	5V	107	5V
93	5V	108	5V
94	5V	109	5V
95	5V	110	5V
96	5V	111	5V
97	5V	112	5V
98	5V	113	5V
99	5V	114	5V
100	5V	115	5V
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102	5V	117	5V
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104	5V	119	5V
105	5V	120	5V
106	5V	121	5V
107	5V	122	5V
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135	5V	150	5V
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140	5V	155	5V
141	5V	156	5V
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144	5V	159	5V
145	5V	160	5V
146	5V	161	5V
147	5V	162	5V
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149	5V	164	5V
150	5V	165	5V
151	5V	166	5V
152	5V	167	5V
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154	5V	169	5V
155	5V	170	5V
156	5V	171	5V
157	5V	172	5V
158	5V	173	5V
159	5V	174	5V
160	5V	175	5V
161	5V	176	5V
162	5V	177	5V
163	5V	178	5V
164	5V	179	5V
165	5V	180	5V
166	5V	181	5V
167	5V	182	5V
168	5V	183	5V
169	5V	184	5V
170	5V	185	5V
171	5V	186	5V
172	5V	187	5V
173	5V	188	5V
174	5V	189	5V
175	5V	190	5V
176	5V	191	5V
177	5V	192	5V
178	5V	193	5V
179	5V	194	5V
180	5V	195	5V
181	5V	196	5V
182	5V	197	5V
183	5V	198	5V
184	5V	199	5V
185	5V	200	5V
186	5V	201	5V
187	5V	202	5V
188	5V	203	5V
189	5V	204	5V
190	5V	205	5V
191	5V	206	5V
192	5V	207	5V
193	5V	208	5V
194	5V	209	5V
195	5V	210	5V
196	5V	211	5V
197	5V	212	5V
198	5V	213	5V
199	5V	214	5V
200	5V	215	5V
201	5V	216	5V
202	5V	217	5V
203	5V	218	5V
204	5V	219	5V
205	5V	220	5V
206	5V	221	5V
207	5V	222	5V
208	5V	223	5V
209	5V	224	5V
210	5V	225	5V
211	5V	226	5V
212	5V	227	5V
213	5V	228	5V
214	5V	229	5V
215	5V	230	5V
216	5V	231	5V
217	5V	232	5V
218	5V	233	5V
219	5V	234	5V
220	5V	235	5V
221	5V	236	5V
222	5V	237	5V
223	5V	238	5V
224	5V	239	5V
225	5V	240	5V
226	5V	241	5V
227	5V	242	5V
228	5V	243	5V
229	5V	244	5V
230	5V	245	5V
231	5V	246	5V
232	5V	247	5V
233	5V	248	5V
234	5V	249	5V
235	5V	250	5V
236	5V	251	5V
237	5V	252	5V
238	5V	253	5V
239	5V	254	5V
240	5V	255	5V
241	5V	256	5V
242	5V	257	5V
243	5V	258	5V
244	5V	259	5V
245	5V	260	5V
246	5V	261	5V
247	5V	262	5V
248	5V	263	5V
249	5V	264	5V
250	5V	265	5V
251	5V	266	5V
252	5V	267	5V
253	5V	268	5V
254	5V	269	5V
255	5V	270	5V
256	5V	271	5V
257	5V	272	5V
258	5V	273	5V
259	5V	274	5V
260	5V	275	5V
261	5V	276	5V
262	5V	277	5V
263	5V	278	5V
264	5V	279	5V
265	5V	280	5V
266	5V	281	5V
267	5V	282	5V
268	5V	283	5V
269	5V	284	5V
270	5V	285	5V
271	5V	286	5V
272	5V	287	5V
273	5V	288	5V
274	5V	289	5V
275	5V	290	5V
276	5V	291	5V
277	5V	292	5V
278	5V	293	5V
279	5V	294	5V
280	5V	295	5V
281	5V	296	5V
282	5V	297	5V
283	5V	298	5V
284	5V	299	5V
285	5V	300	5V
286	5V	301	5V
287	5V	302	5V
288	5V	303	5V
289	5V	304	5V
290	5V	305	5V
291	5V	306	5V
292	5V	307	5V
293	5V	308	5V
294	5V	309	5V
295	5V	310	5V
296	5V	311	5V
297	5V	312	5V
298	5V	313	5V
299	5V	314	5V
300	5V	315	5V
301	5V	316	5V
302	5V	317	5V
303	5V	318	5V
304	5V	319	5V
305	5V	320	5V
306	5V	321	5V
307	5V	322	5V
308	5V	323	5V
309	5V	324	5V
310	5V	325	5V
311	5V	326	5V
312	5V	327	5V
313	5V	328	5V
314	5V	329	5V
315	5V	330	5V
316	5V	331	5V
317	5V	332	5V
318	5V	333	5V
319	5V	334	5V
320	5V	335	5V
321	5V	336	5V
322	5V	337	5V
323	5V	338	5V
324	5V	339	5V
325	5V	340	5V
326	5V	341	5V
327	5V	342	5V
328	5V	343	5V
329	5V	344	5V
330	5V	345	5V
331	5V	346	5V
332	5V	347	5V
333	5V	348	5V
334	5V	349	5V
335	5V	350	5V
336	5V	351	5V
337	5V	352	5V
338	5V	353	5V
339	5V	354	5V
340	5V	355	5V
341	5V	356	5V
342	5V	357	5V
343	5V	358	5V
344	5V	359	5V
345	5V	360	5V
346	5V	361	5V
347	5V	362	5V
348	5V	363	5V
349	5V	364	5V
350	5V	365	5V
351	5V	366	5V
352	5V	367	5V
353	5V	368	5V
354	5V	369	5V
355	5V	370	5V
356	5V	371	5V
357	5V	372	5V
358	5V	373	5V
359	5V	374	5V
360	5V	375	5V
361	5V	376	5V
362	5V	377	5V
363	5V	378	5V
364	5V	379	5V
365	5V	380	5V
366	5V	381	5V
367	5V	382	5V
368	5V	383	5V
369	5V	384	5V</

(PWW149S:HB TYPE)  
(PWW1490:K.U.K.CHEM AND 2D TYPES)  
ANALOG BOARD ASSEMBLY



TO MAIN BOARD  
ASSEMBLY

TO MAIN BOARD  
ASSEMBLY

no.	Voltage	no.	Voltage
1	0	1	2
2	0	2	2
3	0	3	2
4	0	4	2
5	0	5	2
6	0	6	2
7	0	7	2
8	0	8	2
9	0	9	2
10	0	10	2
11	0	11	2
12	0	12	2
13	0	13	2
14	0	14	2
15	0	15	2
16	0	16	2
17	0	17	2
18	0	18	2
19	0	19	2
20	0	20	2
21	0	21	2
22	0	22	2
23	0	23	2
24	0	24	2
25	0	25	2
26	0	26	2
27	0	27	2
28	0	28	2
29	0	29	2
30	0	30	2
31	0	31	2
32	0	32	2
33	0	33	2
34	0	34	2
35	0	35	2
36	0	36	2
37	0	37	2
38	0	38	2
39	0	39	2
40	0	40	2
41	0	41	2
42	0	42	2
43	0	43	2
44	0	44	2
45	0	45	2
46	0	46	2
47	0	47	2
48	0	48	2
49	0	49	2
50	0	50	2
51	0	51	2
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53	0	53	2
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61	0	61	2
62	0	62	2
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64	0	64	2
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66	0	66	2
67	0	67	2
68	0	68	2
69	0	69	2
70	0	70	2
71	0	71	2
72	0	72	2
73	0	73	2
74	0	74	2
75	0	75	2
76	0	76	2
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78	0	78	2
79	0	79	2
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81	0	81	2
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87	0	87	2
88	0	88	2
89	0	89	2
90	0	90	2
91	0	91	2
92	0	92	2
93	0	93	2
94	0	94	2
95	0	95	2
96	0	96	2
97	0	97	2
98	0	98	2
99	0	99	2
100	0	100	2

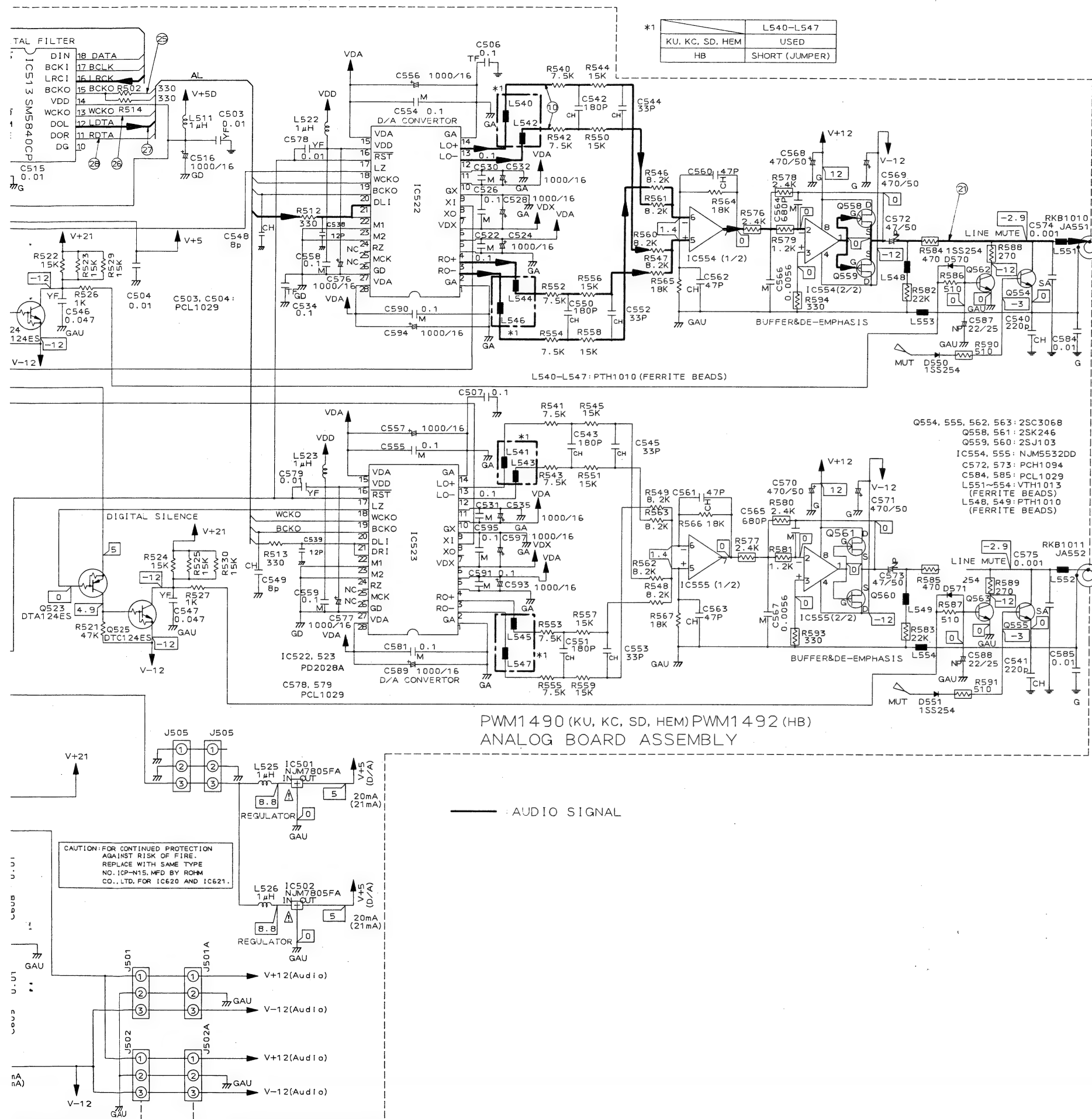
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4	5
5	6
6	7
7	8
8	9
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10	11
11	12
12	13
13	14
14	15
15	16
16	17
17	18
18	19
19	20

**This P.C.B. connection diagram is viewed from the foil side.**





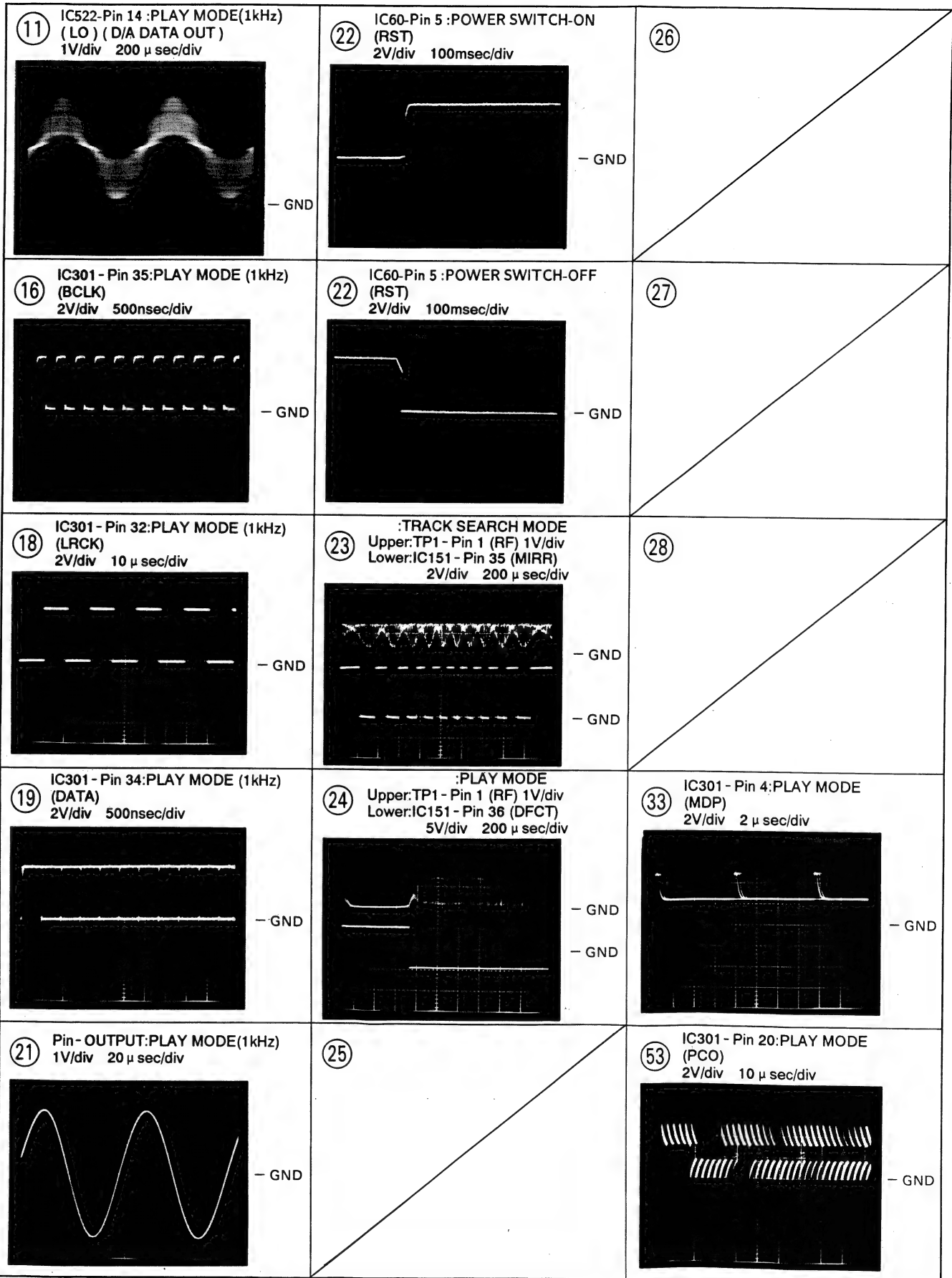
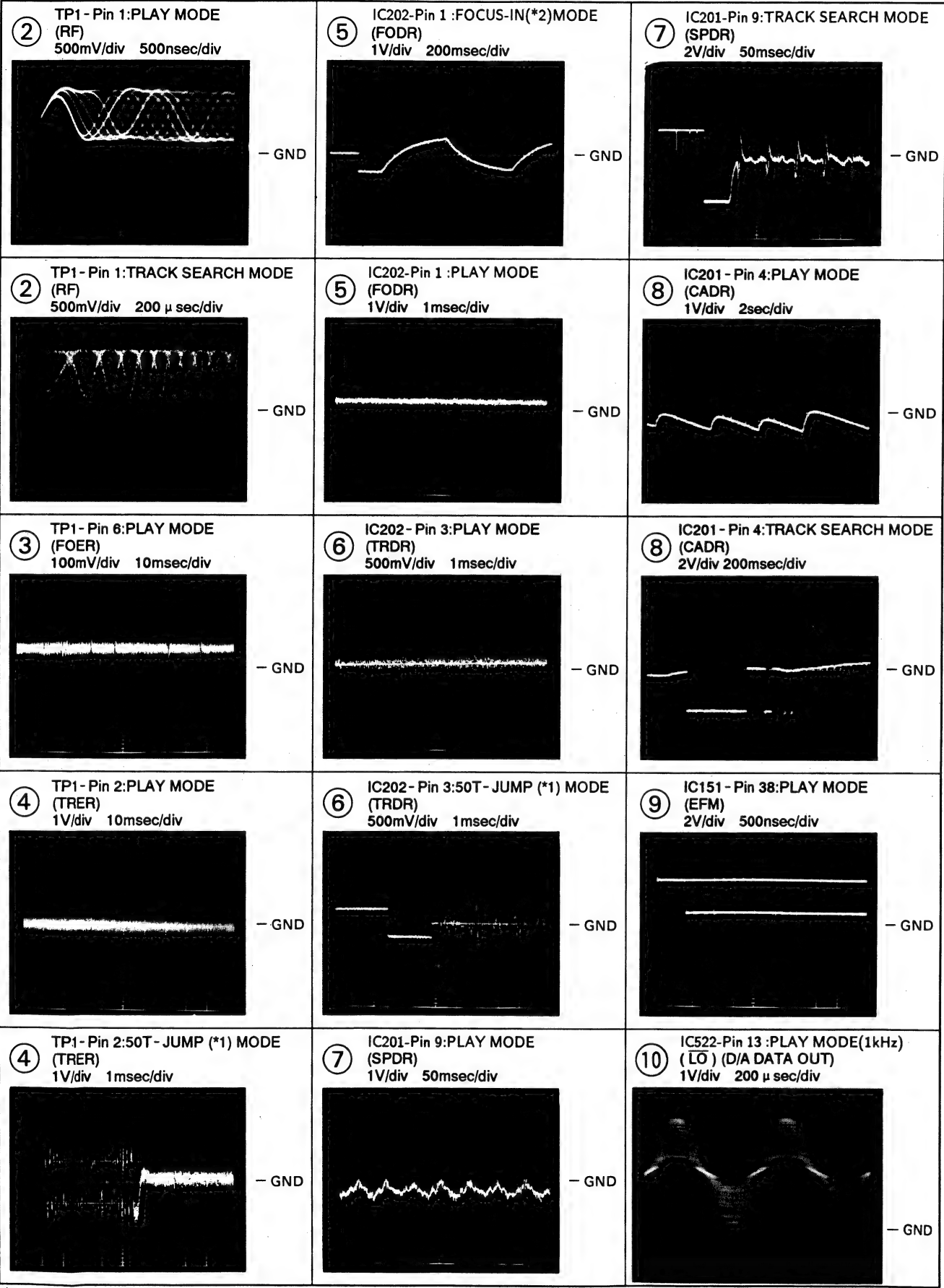




4.3 WAVEFORMS

Note: The encircled numbers denote measuring in the schematic diagram.

\*1 50T-JUMP: After switching to the pause mode, press the manual search key.  
\*2 FOCUS-IN: Press the key without loading a disc.



5. P.

NOTES:  
• Parts  
• Parts  
• unava  
• The  
• There  
• When  
Ex. 1

Ex. 2

Mark No.

● ANALO

SEMICON

△ IC501  
△ IC512  
△ IC513  
△ IC522  
△ IC554

△ IC601  
△ IC602  
△ IC620

Q521  
Q522  
Q524  
Q554  
Q558

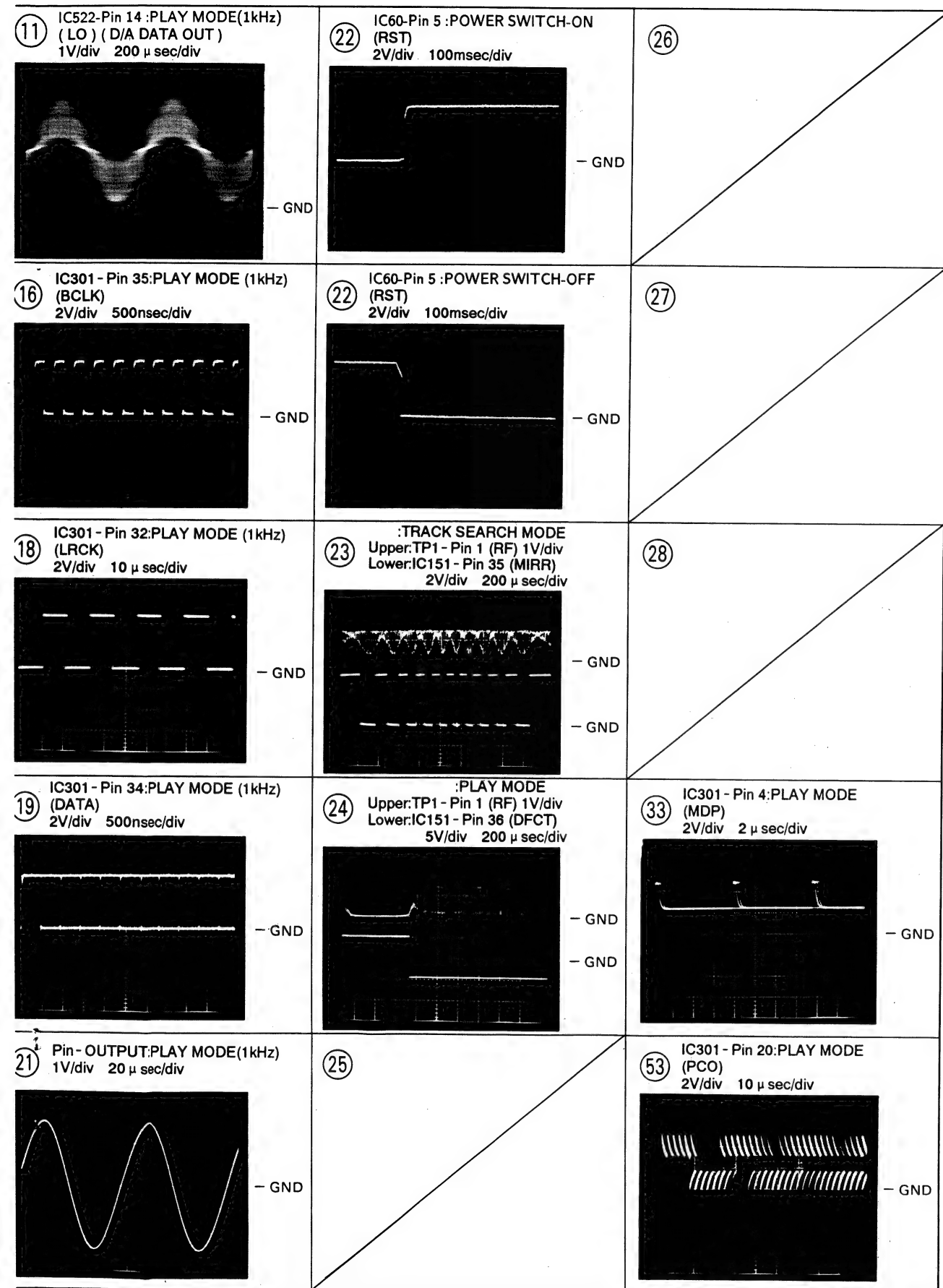
Q559  
Q561  
Q562

D521  
D550  
D570  
D610  
D620

COILS AND

L511  
L522  
L525  
L540  
L551  
L564





## 5. P.C.B.'s PARTS LIST

### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 $\Omega$  56  $\times 10^1$  561 ..... RD1/4PS561J

47k $\Omega$  47  $\times 10^3$  473 ..... RD1/4PS473J

0.5 $\Omega$  0R5 ..... RD2H0R5K

1 $\Omega$  010 ..... RD1P010K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k $\Omega$  562  $\times 10^1$  5621 ..... RD1/4SR5621F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
●ANALOG BOARD ASSEMBLY (PWM1490)				CAPACITORS			
SEMICONDUCTORS							
$\Delta$		IC501,IC502 REGULATOR IC	NJM7805FA	C501,C502 AUDIO FILM CAPACITOR			
		IC512 LOGIC IC	TC74HCU04AP	C503,C504 CERAMIC CAPACITOR			
		IC513 DIGITAL FILTER,IC	SM5840CP	C505 ELECTR.CAPACITOR			
		IC522,IC523 D/A CONVERTER,IC	PD2028A	C506,C507 AUDIO FILM CAPACITOR			
		IC554,IC555 OP-AMP IC	NJM5532DD	C511 CERAMIC CAPACITOR			
$\Delta$		IC601 REGULATOR IC	NJM7812FA	C512 AUDIO FILM CAPACITOR			
$\Delta$		IC602 REGULATOR IC	NJM7912FA	C514 CERAMIC CAPACITOR			
$\Delta$		IC620,IC621 IC PROTECTOR	ICP-N15	C515 AUDIO FILM CAPACITOR			
		Q521 TRANSISTOR	DTC124ES	C516 ELECTR.CAPACITOR			
		Q522,Q523 TRANSISTOR	DTA124ES	C517,C518 CERAMIC CAPACITOR			
		Q524,Q525 TRANSISTOR	DTC124ES	C519 ELECTR.CAPACITOR			
		Q554,Q555 TRANSISTOR	2SC3068	C520 ELECTR.CAPACITOR			
		Q558 TRANSISTOR	2SK246	C521 MYLOR FILM CAPACITOR			
		Q559,Q560 FET	2SJ103	C522 MYLOR FILM CAPACITOR			
		Q561 TRANSISTOR	2SK246	C523 CERAMIC CAPACITOR			
		Q562,Q563 TRANSISTOR	2SC3068	C524 ELECTR.CAPACITOR			
		D521 DIODE	1SS254	C526 MYLOR FILM CAPACITOR			
		D550,D551 DIODE	1SS254	C528 ELECTR.CAPACITOR			
		D570,D571 DIODE	1SS254	C530,C531 MYLOR FILM CAPACITOR			
		D610-D613 DIODE	10DF2	C532 ELECTR.CAPACITOR			
		D620-D627 DIODE	10DF2	C534 AUDIO FILM CAPACITOR			
COILS AND FILTERS				C535 ELECTR.CAPACITOR			
		L511,L512 AXIAL INDUCTOR	LAU010K	C538,C539 CERAMIC CAPACITOR			
		L522,L523 AXIAL INDUCTOR	LAU010K	C540,C541 CERAMIC CAPACITOR			
		L525,L526 AXIAL INDUCTOR	LAU010K	C542,C543 CERAMIC CAPACITOR			
		L540-L549 FERRITE BEADS	PTH1010	C544,C545 CERAMIC CAPACITOR			
		L551-L554 FERRITE BEADS	VTH1013	C546,C547 CERAMIC CAPACITOR			
		L564	PTH1006	C548,C549 CERAMIC CAPACITOR			
				C550,C551 CERAMIC CAPACITOR			
				C552,C553 CERAMIC CAPACITOR			
				C554,C555 MYLOR FILM CAPACITOR			
				C556,C557 ELECTR.CAPACITOR			
				C558,C559 MYLOR FILM CAPACITOR			
				C560-C563 CERAMIC CAPACITOR			
				C564,C565 MYLOR FILM CAPACITOR			

Mark	No.	Description	Parts No.
	C566,C567	MYLOR FILM CAPACITOR	CQMA562J50
	C568-C571	ELECTR.CAPACITOR	CEAS471M50
	C572,C573	ELECTROLYTIC CAPACIT	PCH1094
	C574,C575	PL.STYRENE CAPACITOR	CQSA102J50
	C576,C577	ELECTR.CAPACITOR	CEAS102M16
	C578,C579	CERAMIC CAPACITOR	PCL1029
	C581	MYLOR FILM CAPACITOR	CQMA104J50
	C584,C585	CERAMIC CAPACITOR	PCL1029
	C587,C588	ELECTR.CAPACITOR	CEANP220M25
	C589	ELECTR.CAPACITOR	CEAS102M16
	C590,C591	MYLOR FILM CAPACITOR	CQMA104J50
	C593,C594	ELECTR.CAPACITOR	CEAS102M16
	C595	MYLOR FILM CAPACITOR	CQMA104J50
	C597	ELECTR.CAPACITOR	CEAS102M16
	C601	ELECTROLYTIC CAPACIT	CENA102M35
	C604,C605	ELECTR. CAPACITOR	PCH1102
	C606,C607	ELECTROLYTIC CAPACIT	CENA102M35
	C608-C618	CERAMIC CAPACITOR	PCL1029

## RESISTORS

R540-R567 CARBON FILM RESISTOR RD1/4PM□□□J  
R576-R581 CARBON FILM RESISTOR RDR1/4PM□□□J  
R582-R585 CARBON FILM RESISTOR RDR1/2PM□□□J  
R588,R589 CARBON FILM RESISTOR RDR1/2PM271J  
R590,R591 CARBON FILM RESISTOR RDR1/4PM511J

R593,R594 CARBON FILM RESISTOR RDR1/4PM331J

### Other resistors

RD1/6PM ☐ ☐ ☐ J

## OTHERS

CN501	CONNECTOR(10P)	KPC10
JA551	1P PIN JACK (W)	RKB1010
JA552	1P PIN JACK (R)	RKB1011
X512	XTAL RES (OSC)	PSS1011
	SCREW	BBZ30P080FCC

●MAIN BOARD ASSEMBLY (PWZ2150)







## SEMICONDUCTORS

⚠	IC11 REGULATOR IC	NJM7805FA
	IC12 REGULATOR IC	NJM7905FA
⚠	IC13 REGULATOR IC	NJM7808FA
⚠	IC14 REGULATOR IC	NJM7908FA
⚠	IC30-IC32 IC PROTECTOR	ICP-N10

IC60	SYSTEM RESET IC	M51957AL
IC101	PRE AMP IC	CXA1471S
IC151	SERVO IC	CXA1372S
IC201	POWER OP-AMP,IC	LA6520
IC202	POWER OP-AMP,IC	LA6517

IC301	EFM DEMODULATION IC	CXD2500AQ
IC331	IC	MC74HCU04N

Q51 TRANSISTOR	2SB1187
Q101 TRANSISTOR	2SA854S
Q240 TRANSISTOR	2SA933S
Q241 TRANSISTOR	2SC1740S
Q331 TRANSISTOR	DTC124ES

Mark	No.	Description	Parts No.
	Q351	TRANSISTOR	DTA124ES
	Q391	TRANSISTOR	DTC124ES
	D11-D14	DIODE	11ES2
	D25		RB-152LF
	D51,D52	DIODE	11ES2
	D53	ZENER DIODE	MTZ27C
	D54	ZENER DIODE	MTZJ20A
	D56	DIODE	11ES2
	D391-D399	DIODE	1SS254

## COILS AND FILTERS

L30	AXIAL INDUCTOR	LAU010K
L301	RADIAL INDUCTOR	LRA010K
L332	COIL	PTL1003
L391,L392	AXIAL COIL	LAUR22K
L393	AXIAL INDUCTOR	LAU010K

## CAPACITORS

C10,C11 CERAMIC CAPACITOR	PCL1029
C13-C20 CERAMIC CAPACITOR	PCL1029
C21,C22 ELECTR.CAPACITOR	CEAS222M25
C23 ELECTR.CAPACITOR	CEAS102M25
C25,C26 ELECTR.CAPACITOR	CEAS222M16

C27,C28 ELECTR.CAPACITOR	CEAS222M25
C29,C30 ELECTR.CAPACITOR	CEAS102M16
C51 ELECTR.CAPACITOR	CEAS101M50
C52 ELECTR.CAPACITOR	CEAS221M50
C53 ELECTR.CAPACITOR	CEAS100M50

C54	ELECTR.CAPACITOR	CEAS470M50
C55	ELECTROLYTIC CAPACIT	CEAS330M35
C56	ELECTR.CAPACITOR	CEAS101M50
C61	ELECTR.CAPACITOR	CEASR33M50
C62	ELECTR.CAPACITOR	CEAS010M50

C101,C102 ELECTR.CAPACITOR	CEAS221M25
C103 CERAMIC CAPACITOR	CCCCH200J50
C104 ELECTR.CAPACITOR	CEAS101M10
C105,C106 ELECTR.CAPACITOR	CEAS221M25
C107,C108 CERAMIC CAPACITOR	CGCYX103K25

C110 CERAMIC CAPACITOR	CKCYF103Z50
C151-C154 ELECTR.CAPACITOR	CEAS221M25
C155 CERAMIC CAPACITOR	CKCYB182K50
C156 CERAMIC CAPACITOR	CGCYX333K25
C157 CERAMIC CAPACITOR	CGCYX103K25

C158,C159 MYLOR FILM CAPACITOR	CQMA104K50
C160 ELECTR.CAPACITOR	CEAS4R7M50
C161 MYLOR FILM CAPACITOR	CQMA104K50
C162 ELECTR.CAPACITOR	CEAS010M50
C163 MYLOR FILM CAPACITOR	CQMA104K50

C164	CERAMIC CAPACITOR	CGCYX103K25
C166	CERAMIC CAPACITOR	CCCSL101J50
C167	CERAMIC CAPACITOR	CKCYF103Z50
C168	CERAMIC CAPACITOR	CGCYX333K25
C169	CERAMIC CAPACITOR	CGCYX103K25

Mark	No.	Description	Parts No.
	C170	CERAMIC CAPACITOR	CKCYB332K50
	C171,C172	CERAMIC CAPACITOR	CKCYB472K50
	C202	CERAMIC CAPACITOR	CKCYF103Z50
	C212	CERAMIC CAPACITOR	CKCYB272K50
	C216-C219	ELECTR. CAPACITOR	CEAS221M25
	C232	CERAMIC CAPACITOR	CKCYF103Z50
	C301	CERAMIC CAPACITOR	CGCYX103K25
	C302,C303	ELECTR. CAPACITOR	CEAS471M10
	C304	CERAMIC CAPACITOR	CGCYX103K25
	C305	ELECTR. CAPACITOR	CEAS471M10
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	CERAMIC CAPACITOR	CGCYX473K25
	C308	CERAMIC CAPACITOR	CGCYX103K25
	C309	ELECTR. CAPACITOR	CEAS47M50
	C310	CERAMIC CAPACITOR	CKCYF103Z50
	C311	CERAMIC CAPACITOR	CKCYB102K50
	C313	CERAMIC CAPACITOR	CKCYF103Z50
	C331	CERAMIC CAPACITOR	CGCYX473K25
	C332	ELECTR. CAPACITOR	CEAS101M25
	C334	CERAMIC CAPACITOR	CGCYX103K25
	C335	ELECTR. CAPACITOR	CEAS470M25
	C336	AUDIO FILM CAPACITOR	CFTXA103J50
	C337	CERAMIC CAPACITOR	CCCSL471J50
	C339,C340	CERAMIC CAPACITOR	CGCYX103K25
	C391	CERAMIC CAPACITOR	CGCYX103K25
	C392	CERAMIC CAPACITOR	CCCSL101J50
	C395	CERAMIC CAPACITOR	CCDSL100D50

**RESISTORS**

VR102	VR	VRTB6VS223
VR103	VR	VRTB6VS102
VR151	VR	VRTB6VS223
VR152	VR	VRTB6VS223
Other resistors		RD1/6PM□□□J

**OTHERS**

CN101	CONNECTOR	52045-1610
CN351	CONNECTOR	HLEM33S
JA331	OPTICAL OUTPUT JACK	TOTX178
JA332	JACK	PKB1004
JA391,JA392	JACK	RKN1004
JA393	JACK	RKN1014

**PRIMARY BOARD ASSEMBLY****SWITCHES**

△	S1 SWITCH (POWER)	PSA-009
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**CAPACITORS**

△	C1 CAPACITOR (CERAMIC)	VCG-048
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Mark	No.	Description	Parts No.
------	-----	-------------	-----------

**●FUNCTION A BOARD ASSEMBLY (PWZ2168)**
**SEMICONDUCTORS**

IC401	MICROCOMPUTER,IC	PD4329A
Q402,Q403	TRANSISTOR	DTC124ES
Q404,Q405	TRANSISTOR	DTA124ES
D401	LED	AA0045
D402	LED	BR0045
D411-D416	DIODE	1SS254

**SWITCHES**

S401-S406	SWITCH	PSG-065
(TRK FF, TRK REV, PAUSE )		
(PLAY, OPEN/CLOSE, STOP)		

**FILTERS**

L401,L402	AXIAL INDUCTOR	LAU010K
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**CAPACITORS**

C401,C402	ELECTROLYTIC CAPACIT	CEJA470M16
C403	CERAMIC CAPACITOR	CKPUYF103Z25
C404	ELECTROLYTIC CAPACIT	CEJA470M16
C405	CERAMIC CAPACITOR	CKPUYF103Z25
C406-C408	CERAMIC CAPACITOR	CGCYX103K25
C409	CERAMIC CAPACITOR	CKCYF103Z50
C411-C416	AXIAL CERAMIC C.	CCPUCH100J50

**RESISTORS**

All resistors	RD1/6PM□□□J
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**OTHERS**

CN401	CONNECTOR	HLEM33R
V401	FL TUBE	PEL1025
X401	CERAMIC RESONATOR	VSS1014
	REMOTE SENSOR	SBX1610

**FUNCTION B BOARD ASSEMBLY****SEMICONDUCTORS**

D403	LED	SLH-34YC3H3
D404	LED	SLH-34VC3H3
D405	LED	SLH-34VC3H3
D417	DIODE	1SS254

**SWITCHES**

S407,S408	SWITCH	PSG-065
(DISPLAY OFF, OUTPUT)		

**CAPACITORS**

C417	AXIAL CERAMIC C.	CCPUCH100J50
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## 6. ADJUSTMENTS

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pick up or the circuitry. Adjust correctly following the adjustment procedure.

### 6-1. Adjustment items/verification item and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP 1, Pin 6(FCS.ERR)	VR 103(FCS.OFS)
2	Grating adjustment	TP 1, Pin 2(TRK.ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP 1, Pin 2(TRK.ERR)	VR 102(TRK. BAL)
4	Pick up radial/tangential direction tilt adjustment	TP 1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment (RF level)	TP 1, Pin 1(RF)	VR 1(RF level)
6	Focus servo loop gain adjustment	TP 1, Pin 5(FCS.IN) TP 1, Pin 6(FCS.ERR)	VR 152(FCS.GAN)
7	Tracking servo loop gain adjustment	TP 1, Pin 3(TRK.IN) TP 1, Pin 2(TRK.ERR)	VR 151(TRK.GAN)
8	Focus error signal verification	TP 1, Pin 6(FCS.ERR)	—

#### ● Abbreviation table

FCS.ERR : Focus Error  
 FCS.OFS : Focus Offset  
 TRK.ERR : Tracking Error  
 TRK.BAL : Tracking Balance  
 FCS.GAN : Focus Gain  
 TRK.GAN : Tracking Gain  
 FCS.IN : Focus In  
 TRK.IN : Tracking In

### 6-2. Measuring instruments and tools

1. Dual trace oscilloscope (10 : 1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low-pass filter (39 k $\Omega$ + 0.001  $\mu$ F)
5. Resistor (100 k $\Omega$ )
6. Standard tools



### 6-3. Test point and adjustment variable resistor positions

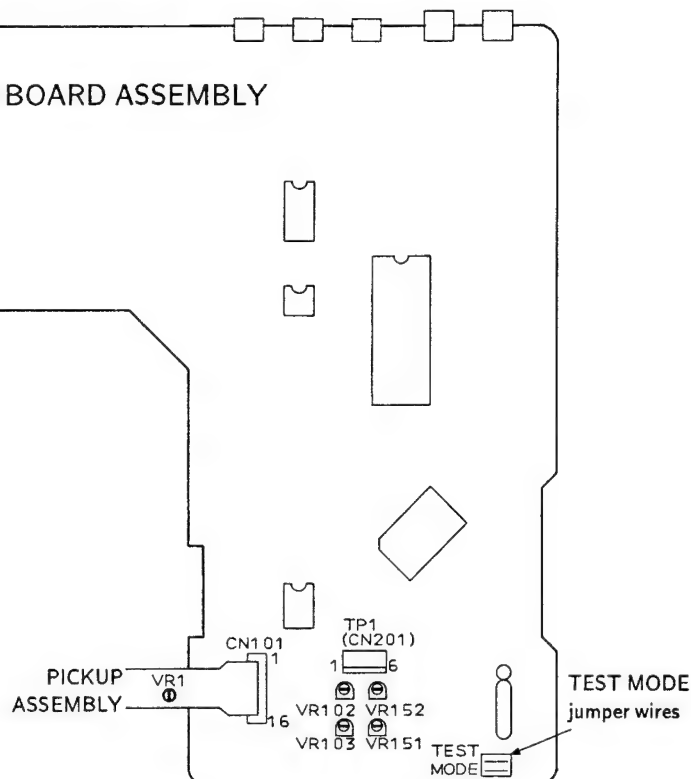


Figure 1 Adjustment Locations

### 6-4. Notes

1. Use a 10 : 1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10 : 1 probe is used.

### 6-5. Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

#### [Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat steps 1-3.

**[Release from test mode]**

Here is the procedure for releasing test mode :

1. Press the STOP key to stop all operations.
2. Turn off the power switch on the front panel.

**[Operations of the keys in test mode]**

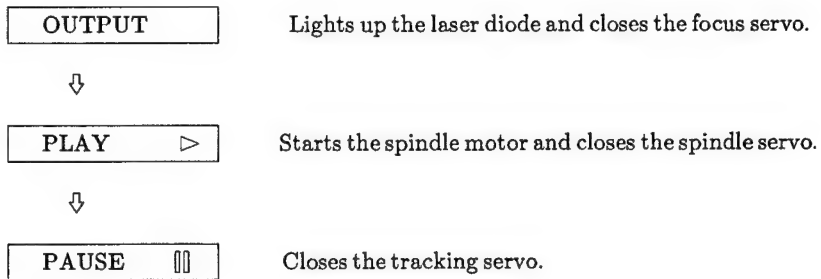
Code	Key name	Function in test mode	Explanation
	OUTPUT	Focus servo close	<p>The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo.</p> <p>If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised twice and returned to its original position.</p>
▷	PLAY	Spindle servo On	<p>Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop.</p> <p>Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed.</p> <p>If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the periphery edge of the disc, the same symptom is occurred.</p>
⏸	PAUSE	Tracking servo close/open	<p>Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal.</p> <p>If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem.</p> <p>This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.</p>

Code	Key name	Function in test mode	Explanation
⏮	TRACK REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏭	TRACK FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
△	OPEN/CLOSE	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

**[How to play back a disc in test mode]**

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.



Wait at least 2-3 seconds between each of these operations.



## 1. Focus offset adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 6 (FCS ERR).	● Player state	Test mode, stopped (just the Power switch on)
	[Settings]      5 mV/division 10 ms/division DC mode	● Adjustment location	VR 103 (FCS OFS)
		● Disc	None needed

### [Procedure]

Adjust VR 103 (FCS OFS) so that the DC voltage at TP 1, Pin 6 (FCS ERR) is  $-150 \pm 50$  mV.

## 2. Grating adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2)	● Player state	Test mode, focus and spindle servos closed and tracking servo open.
	[Settings] 50 mV/division 5 ms/division DC mode	● Adjustment location	Pickup grating adjustment slit
		● Disc	YEDS-7

### [Procedure]

1. Move the pickup to midway across the disc (R=35 mm) with the TRACK FWD  $\blacktriangleright$  or REV  $\blacktriangleleft$  key.
2. Press the OUTPUT key, then the PLAY  $\blacktriangleright$  key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

Reference : Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

Note : The amplitude of the tracking error signal is about 3 V<sub>p-p</sub> (when a 39 k $\Omega$  + 0.001  $\mu$ F low pass filter is used). If this amplitude is extremely small (2 V<sub>p-p</sub> or less), then the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the TRACK REV  $\blacktriangleleft$  key, press the PAUSE  $\square$  key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

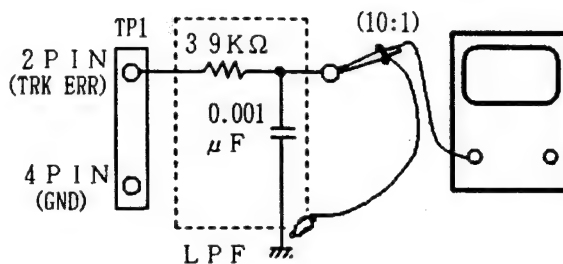
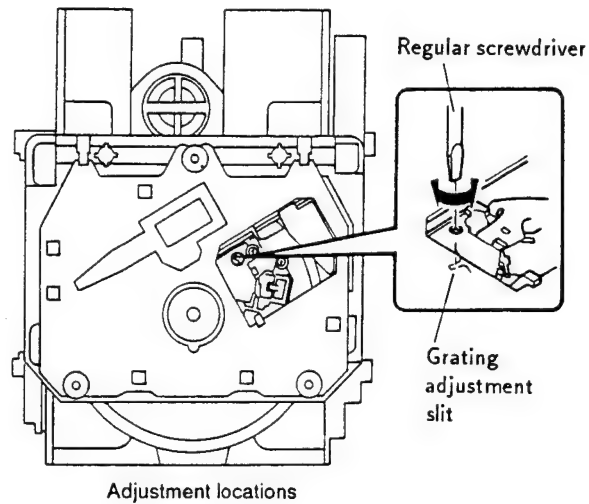


Figure 2



[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP 1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

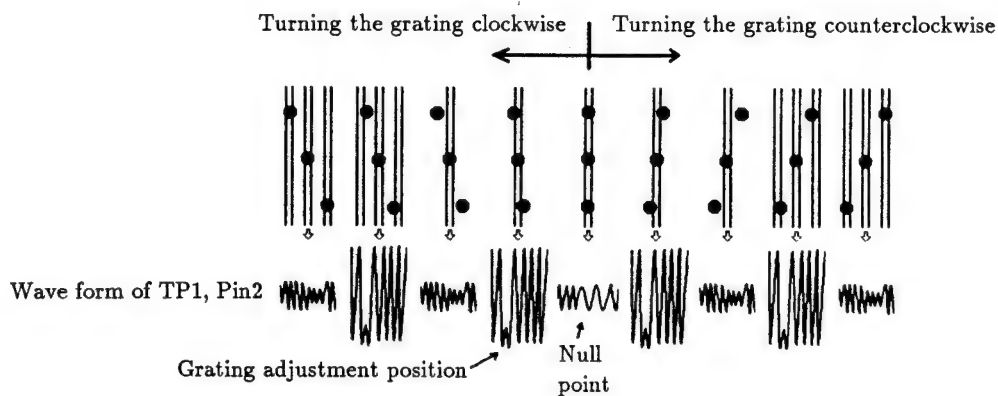
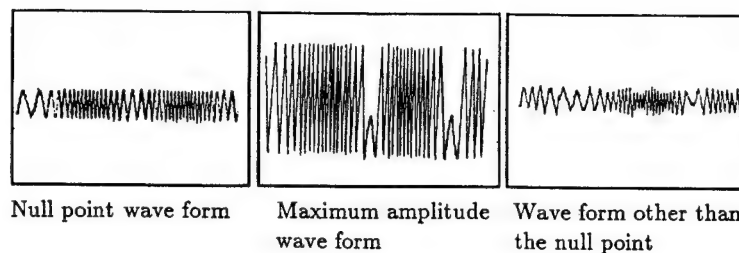


Figure 3

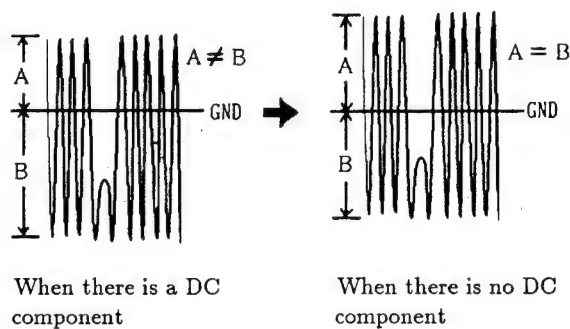


### 3. Tracking error balance adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 2 (TRK ERR). This connection may be via a low pass filter.	● Player state	Test mode, focus and spindle servos closed and tracking servo open
	[Settings]      50 mV/division 5 ms/division DC mode	● Adjustment location	VR 102 (TRK BAL)
		● Disc	YEDS-7

#### [Procedure]

1. Move the pickup to midway across the disc ( $R = 35 \text{ mm}$ ) with the TRACK FWD  $\blacktriangleright\blacktriangleright$  or REV  $\blacktriangleleft\blacktriangleleft$  key.
2. Press the OUTPUT key, then the PLAY key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR 102 (TRK BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP 1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).





## 4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken ; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 1 (RF).	● Player state	Test mode, play
	[Settings]      20 mV/division 200 ns/division AC mode	● Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		● Disc	YEDS-7

### [Procedure]

1. Press the TRACK FWD or REV key to move the pickup to halfway across the disc ( $R = 35$  mm). Press the OUTPUT key, the PLAY key, then the PAUSE key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note : Radial and tangential mean the directions relative to the disc shown in Figure 4.

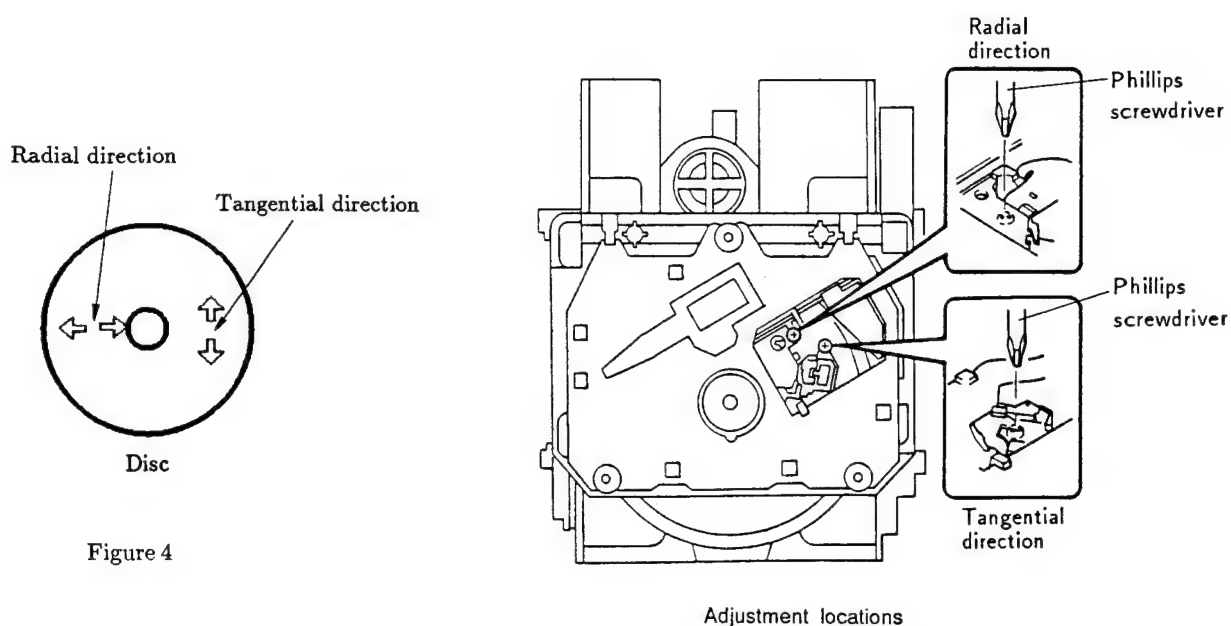


Figure 4

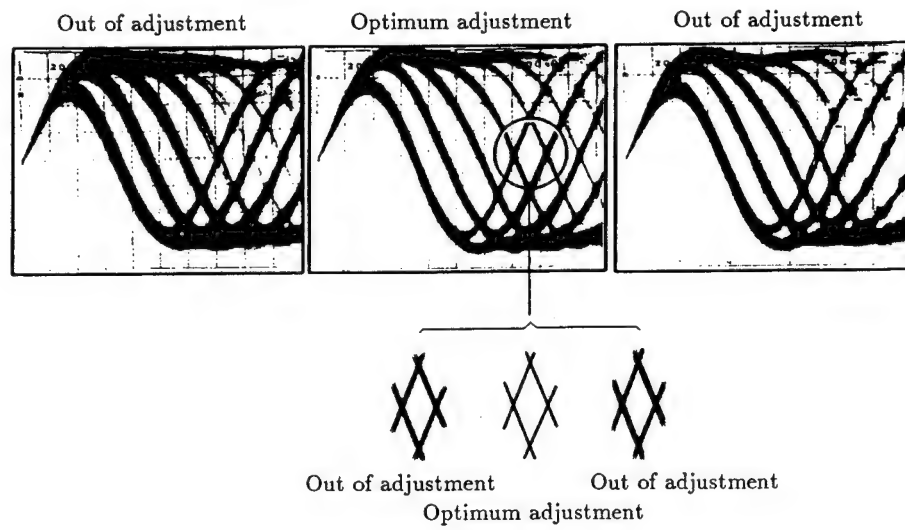


Figure 5 Eye pattern

## 5. RF level adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 1 (RF).	● Player state	Test mode, play
	[Settings]      50 mV/division 10 ms/division AC mode	● Adjustment location	VR 1 (laser power)
		● Disc	YEDS-7

### [Procedure]

1. Move the pickup to midway across the disc ( $R = 35 \text{ mm}$ ) with the TRACK FWD  $\blacktriangleright$  or REV  $\blacktriangleleft$  key, then press the OUTPUT key, then the PLAY  $\blacktriangleright$  key in that order to close the respective servos and put the player into play mode..
2. Adjust VR 1 (laser power) so that the RF signal amplitude is  $1.2 \text{ V}_{p-p} \pm 0.1 \text{ V}$ .

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6.	● Player state	Test mode, play
	[Settings] CH 1                      CH 2 20 mV/division    5 mV/division X-Y mode	● Adjustment location	VR 152 (FCS GAN)
		● Disc	YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK FWD or REV key to move the pickup to halfway across the disc (R = 35 mm), then press the OUTPUT key, the PLAY key, then the PAUSE key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR 152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

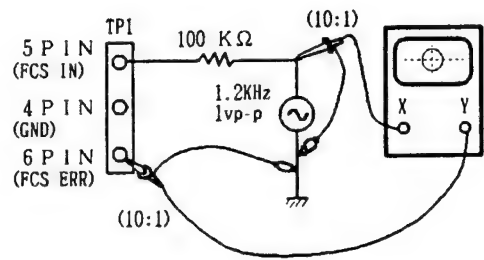
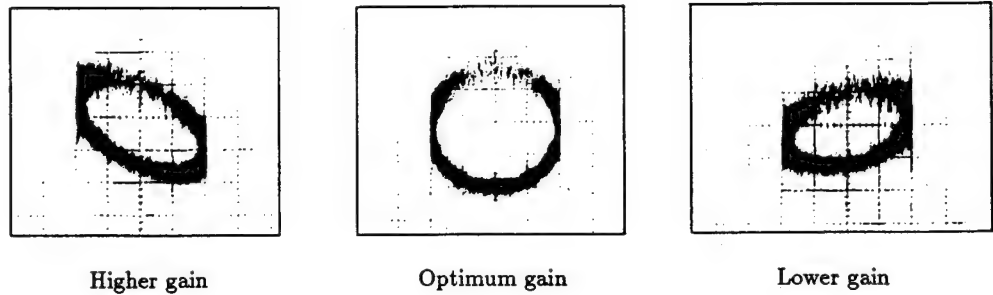


Figure 6

Focus Gain Adjustment





## 7. Tracking servo loop gain adjustment

● Objective	To optimize the tracking servo loop gain		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7.	● Player state	Test mode, play
	[Settings] CH 1 50 mV/division X-Y mode	● Adjustment location	VR 151 (TRK GAN)
	CH 2 50 mV/division X-Y mode	● Disc	YEDS-7

### [Procedure]

1. Set the AF generator output to 1.2 kHz and 1 V<sub>p-p</sub>.
2. Press the TRACK FWD or REV key to move the pickup to halfway across the disc (R = 35 mm), then press the OUTPUT key, the PLAY key, then the PAUSE key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR 151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

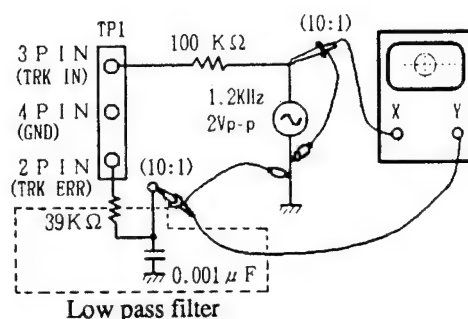
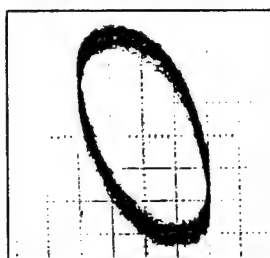
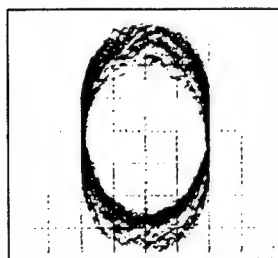


Figure 7

### Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

## 8. Focus error signal(focus S curve)verification

● Objective	To judge whether the pickup is O.K. or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Symptom when out of adjustment			
● Measurement instrument connections	Connect the oscilloscope to TP 1 Pin 6 (FOCS ERR).	● Player state	Test mode, stop
	[Settings] 100 mV/division 5 ms/division DC mode	● Adjustment location	None
		● Disc	YEDS-7

### [Procedure]

1. Connect TP 1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the OUTPUT key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 V<sub>p-p</sub> and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the OUTPUT key is pressed, press this key over and over until you have checked the waveform.

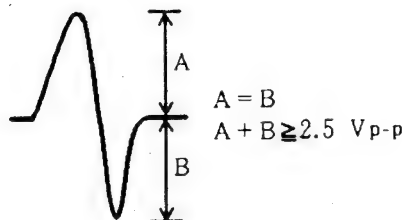


Figure 8

### [Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 V<sub>p-p</sub>).
2. The focus error signal amplitude is extremely small (less than 2.5 V<sub>p-p</sub>).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).
4. The RF signal is too small (less than 0.8 V<sub>p-p</sub>) and even if VR 1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

## 6. RÉGLAGE

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

### 6-1. Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS.ERR)	VR103 (FCS.OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK.ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK.ERR)	VR102 (TRK.BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS.IN) TP1, Broche 6 (FCS.ERR)	VR152 (FCS.GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK.IN) TP1, Broche 2 (TRK.ERR)	VR151 (TRK.GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS.ERR)	—

#### ● Tableau des abréviations

FCS.ERR : erreur de mise au point  
 FCS.OFS : décalage de mise au point  
 TRK.ERR : erreur d'alignement  
 TRK.BAL : équilibrage d'erreur d'alignement  
 FCS.GAN : gain de mise au point  
 TRK.GAN : gain d'alignement  
 FCS.IN : mise au point correcte  
 TRK.IN : alignement correct

### 6-2. Instruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10 : 1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Filtre passe-bas ( $39k\Omega + 0,001\mu F$ )
5. Résistance ( $100k\Omega$ )
6. Outils conventionnels

### 6-3. Point d'essai et positions de réglage de la résistance variable

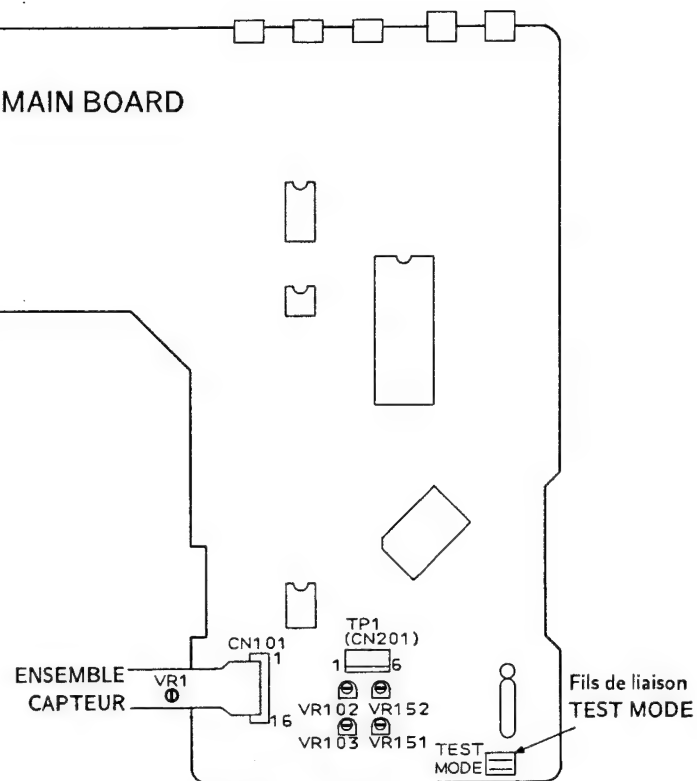


Figure 1 Emplacement des réglages



#### **6-4. Remarques**

1. Utiliser une sonde 10 : 1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10 : 1.

#### **6-5. Mode d'essai**

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire.

Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.

1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Court-circuiter les fils de liaison du mode d'essai. (voir Figure 1).
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure qui termine le mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt.

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	OUTPUT	Fermeture du circuit asservi de la mise au point	<p>La diode laser s'allume et l'actuateur de la mise au point se relève, puis s'abaisse lentement. et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque.</p> <p>Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible.</p> <p>Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point se soulève, se relève, puis s'abaisse et se soulève, une deuxième fois et enfin, revient à sa position départ.</p>
▷	PLAY	Asservissement de rotation en service	<p>Démarré le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée.</p> <p>Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner à la vitesse maximum.</p> <p>Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.</p>
⏸	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	<p>Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture.</p> <p>Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit dérégulé, ou qu'un autre problème se manifeste.</p> <p>Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.</p>

Code	Nom de la touche	Fonction en mode d'essai	Explications
⏮	TRACK REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en bouche fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
⏭	TRACK FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en bouche fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
□	STOP	Arrêt	Initialiser et la rotation du disque s'arrête. Le capteur et le disque ne bougent pas lorsque cette touche est enclenchée.
△	OPEN/CLOSE	Ouverture/Fermeture du plateau à disque	Cette touche est de type à bascule et ouvre/ferme alternativement le plateau. Le fait d'enfoncer cette touche quand le plateau est ouvert le ferme et vice versa.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.

Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

OUTPUT

Allume la diode laser et ferme le circuit servo de la mise au point.



PLAY ▷

Démarre le moteur de rotation et ferme le circuit servo de la rotation.



PAUSE ||

Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.



## 1. Réglage du décalage de la mise au point

• Objectif	Règle le décalage CC de l'amplificateur d'erreur de mise au point.		
• Symptôme quand déréglé	Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).	• Etat du lecteur	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche)
	[Réglages] 5 mV/division 10 ms/division mode CC	• Emplacement du réglage	VR103 (FCS OFS)
		• Disque	Aucun requis

[Marche à suivre]

Ajuster VR103 (FCS OFS) de façon que la tension à TP1 broche 6(FCS ERR) soit  $-150 \pm 50$  mV.

## 2. Réglage du réseau de diffraction

• Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste		
• Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Figure 2)	• Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
	[Réglages] 50 mV/division 5 ms/division mode CC	• Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		• Disque	YEDS-7

### [Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque ( $R=35\text{mm}$ ) par la touche TRACK FWD  $\blacktriangleright$  ou la touche REV  $\blacktriangleleft$ .
2. Appuyer sur la touche OUTPUT, puis sur la touche PLAY  $\triangleright$ , dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens des aiguilles d'une montre à partir du point zéro et régler le réseau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

**Référence:** La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

**Remarque:** L'amplitude du signal d'erreur d'alignement se situe aux environs de 3Vc-c (quand un filtre passe-bas de  $39\text{k}\Omega + 0.001\mu\text{F}$  est utilisé). Si cette amplitude est extrêmement petite (2Vc-c ou moins), il peut s'ensuivre un mauvais fonctionnement de la lentille d'objectif ou du capteur. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.

5. Remplacer le capteur plus ou moins à mi-chemin sur le disque par la touche TRACK REV  $\blacktriangleleft$ , appuyer sur la touche PAUSE  $\square$  et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres n'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

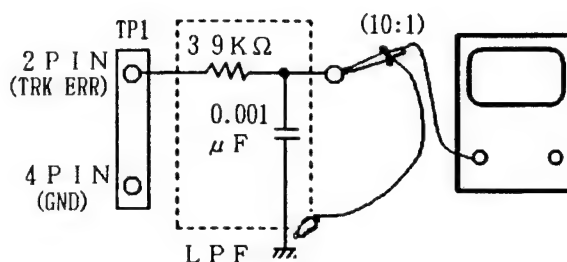
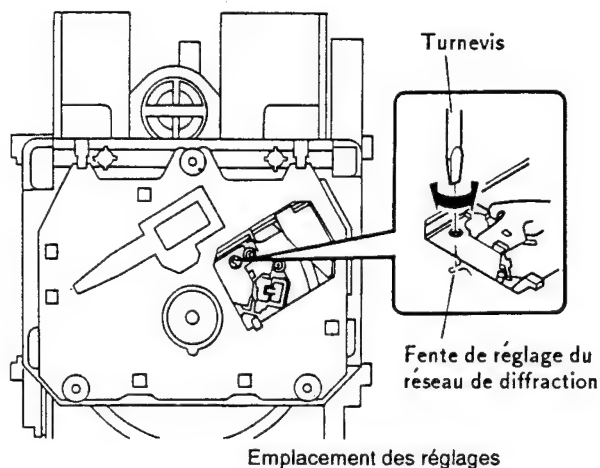


Figure 2



### [Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).

Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

Tourner le réseau de diffraction dans le sens des aiguilles d'une montre      Tourner le réseau de diffraction dans le sens contraire des aiguilles d'une montre

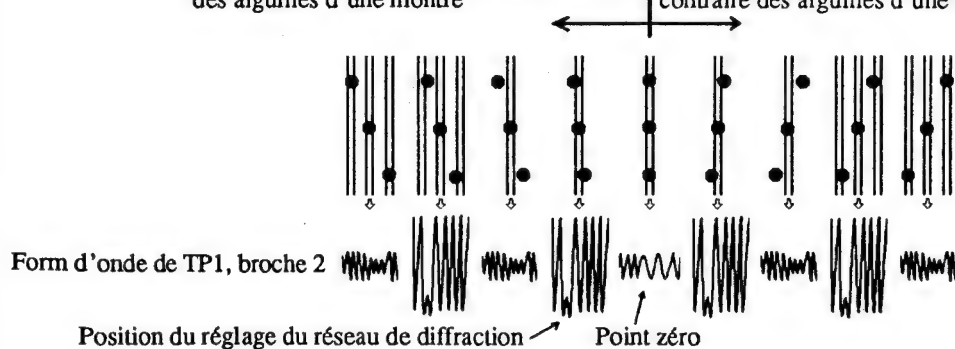
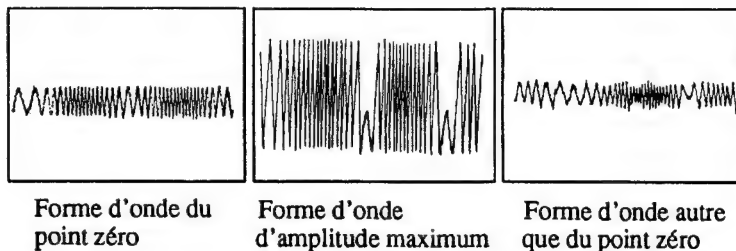


Figure 3

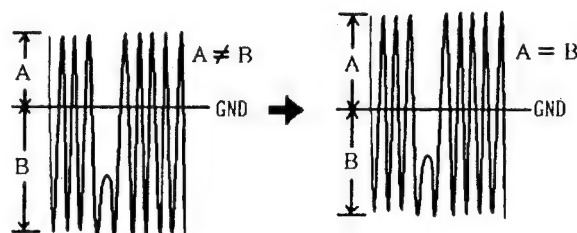


### 3. Réglage d'équilibrage d'erreur d'alignement

• Objectif	Pour corriger la variation de sensibilité de la photodiode d'alignement		
• Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR). Cette connexion peut être faite par l'intermédiaire d'un filtre passe-bas.	• Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
	[Réglages] 50 mV/division 5 ms/division mode CC	• Emplacement du réglage	VR102 (TRK BAL)
		• Disque	YEDS-7

#### [Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque ( $R=35\text{mm}$ ) par la touche TRACK FWD  $\gg$  ou la touche REV  $\ll$ .
2. Appuyer sur la touche OUTPUT, puis sur la touche PLAY  $\triangleright$ , dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC

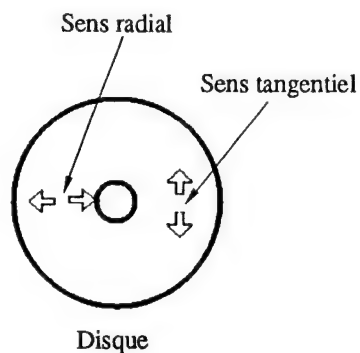
S'il n'y a pas de composant CC

## 4. Réglage d'inclinaison radiale/tangentielle du capteur

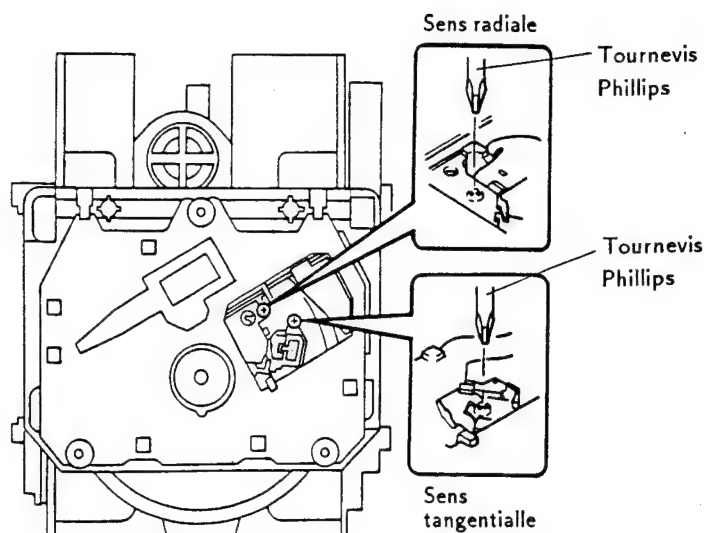
• Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
• Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF).	• Etat du lecteur	Mode d'essai, lecture
	[Réglages] 20 mV/division 200 ns/division mode CA	• Emplacement du réglage	Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle
		• Disque	YEDS-7

### [Marche à suivre]

1. Dans le cas d'un lecteur multidisque, utiliser la touche TRACK FWD ou la touche REV pour déplacer le capteur à mi-chemin sur le disque (R=35mm).  
Appuyer sur la touche OUTPUT, PLAY et PAUSE dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.
  2. D'abord, ajuster la vis d'inclinaison radiale à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.
  3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).
  4. Ajuster de nouveau la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.
- Remarque : "Radial" et "tangentielle" se rapportent aux sens par rapport au disque illustré à la Figure 4.



Disque  
Figure 4



Emplacements des réglages



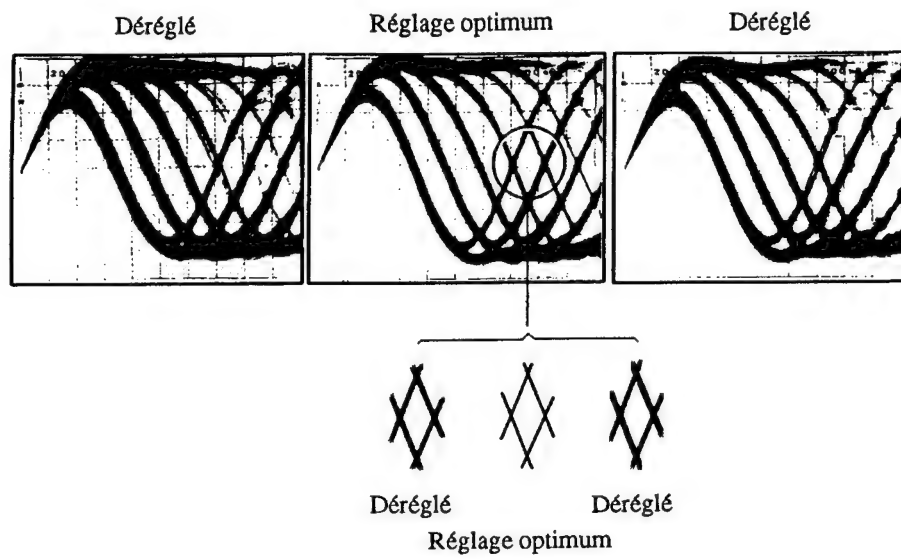





Figure 5 Motif en œil

## 5. Réglage du niveau RF (niveau RF)

• Objectif	Pour optimiser l'amplitude du signal RF de lecture		
• Symptôme quand déréglé	Pas de lecture ni de recherche		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF).	• Etat du lecteur	Mode d'essai, lecture
	[Réglages] 50 mV/division 10 ms/division mode CA	• Emplacement du réglage  • Disque	VR1 (alimentation du laser)  YEDS-7

### [Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque ( $R=35\text{mm}$ ) à l'aide la touche TRACK FWD  ou la touche REV . Ensuite, appuyer sur la touche OUTPUT puis sur la touche PLAY , dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne  $1,2 \text{ V}_{c-c} \pm 0,1 \text{ V}$ .

## 6. Réglage de gain de boucle asservie de la mise au point

• Objectif	Pour optimiser le gain de la boucle d'asservissement de la mise au point.		
• Symptôme quand déréglé	La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
• Raccordement des instruments de mesure	Voir Figure 6.	• Etat du lecteur	Mode d'essai, lecture
	[Réglages]  CAN.1                      CAN.2 20 mV/division      5 mV/division Mode X-Y	• Emplacement du réglage • Disque	VR152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 V<sub>c-c</sub>.
2. Appuyer sur la touche TRACK FWD ou la touche REV pour placer la capteur à mi-chemin sur le disque (R=35mm). Ensuite, appuyer sur la touche OUTPUT, la touche PLAY, puis sur la touche PAUSE, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

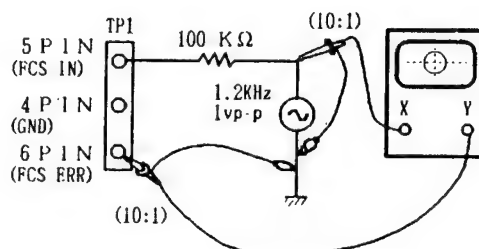
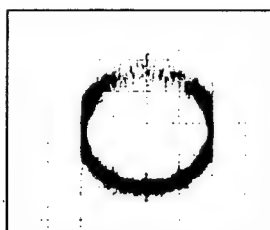


Figure 6

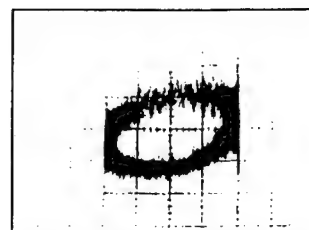
Adjustment de gain de mise au point



Gain Supérieur



Gain optimum



Gain inférieur

## 7. Réglage de gain de boucle asservie de l'alignement

• Objectif	Pour optimiser le gain de la boucle d'asservissement de l'alignement.		
• Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
• Raccordement des instruments de mesure	Voir Figure 7.	• Etat du lecteur	Mode d'essai, lecture
	[Réglages]  CAN.1                      CAN.2 50 mV/division    50mV/division Mode X-Y	• Emplacement du réglage • Disque	VR151 (TRK GAN) YEDS-7

### [Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK FWD ou la touche REV pour placer la capteur à mi-chemin sur le disque (R=35mm). Ensuite, appuyer sur la touche OUTPUT, la touche PLAY, puis sur la touche PAUSE, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

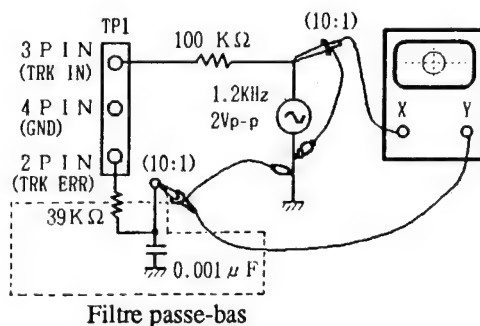
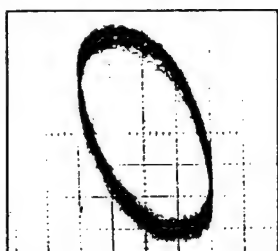
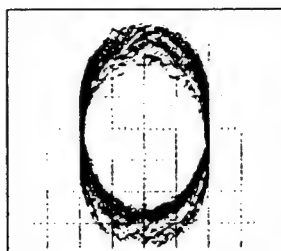


Figure 7

### Adjustment de gain d'alignement



Gain Supérieur



Gain optimum



Gain inférieur

## 8. Vérification du signal d'erreur de la mise au point

• Objectif	Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.		
• Symptôme quand déréglé			
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).	• Etat du lecteur	Mode de test, arrêt
	[Réglages] 100 mV/division 5 ms/division mode CC	• Emplacement du réglage	Aucun
		• Disque	YEDS-7

### [Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche OUTPUT et observer la forme d'onde de la Figure 8, pendant quelques instants. Vérifier que l'amplitude atteint au moins  $2,5 V_{c-c}$  et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche OUTPUT est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

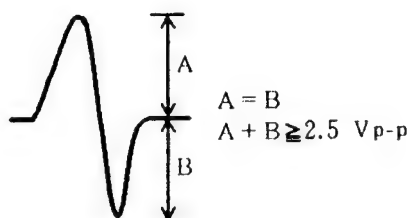


Figure 8

### [Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à  $2 V_{c-c}$ ).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à  $2,5 V_{c-c}$ ).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à  $0,8 V_{c-c}$ ) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.



## 6. AJUSTE

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

### 6-1. Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS.ERR)	VR103 (FCS.OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK.ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimient	TP1, Patilla 2 (TRK.ERR)	VR102 (TRK.BAL)
4	Ajuste de la inclinación en sentido radial/tangencial del captor	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS.IN) TP1, Patilla 6 (FCS.ERR)	VR152 (FCS.GAN)
7	Ajuste de ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK.IN) TP1, Patilla 2 (TRK.ERR)	VR151 (TRK.GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS.ERR)	—

#### ● Tabla de abreviaturas

FCS.ERR : Error de enfoque  
 FCS.OFS : Descentramiento de enfoque  
 TRK.ERR : Error de seguimiento  
 TRK.BAL : Equilibrio de seguimient  
 FCS.GAN : Ganacia de enfoque  
 TRK.GAN : Ganacia de seguimiento  
 FCS.IN : Entrada de enfoque  
 TRK.IN : Entrada de seguimiento

### 6-2. Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10 : 1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Filtro de paso bajo (39k $\Omega$ , 0,001  $\mu$ F)
5. Resistor (100k $\Omega$ )
6. Herramientas estándar

### 6-3. Ubicación de los puntos de prueba y los resistores variables de ajuste

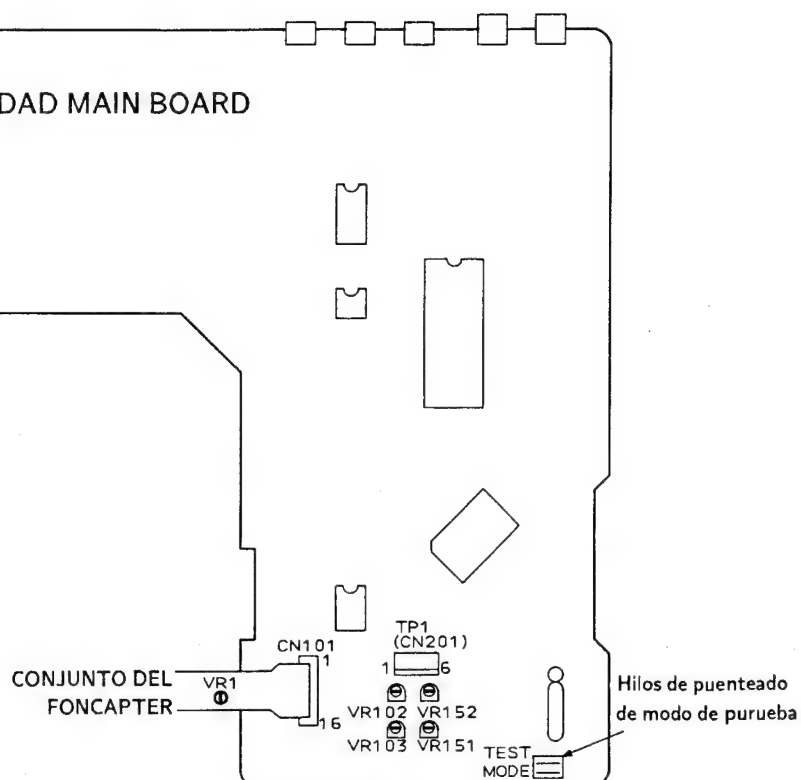


Figura 1 Lugares de ajuste

#### **6-4. Notas**

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

#### **6-5. Modo de prueba**

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.

1. Ponga en OFF el interruptor de alimentación.
2. Cortocircuite los hilos de puenteado de modo de prueba. (Consulte la figura 1.)
3. Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

## [Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.

1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	OUTPUT	Cierre del servo de enfoque	<p>El diodo láser se encenderá y el actuador de enfoque se eleva, después se descende lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoca sobre el disco.</p> <p>Con el reproductor en este estado, si gira ligeramente con la mano el disco parado, podrá oír el sonido del servo de enfoque.</p> <p>Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se ve empujado hacia arriba, y después se levantará y descenderá y se eleva dos veces, y volverá a su posición original.</p>
▷	PLAY	Activación del servo del eje	<p>Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado.</p> <p>Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima.</p> <p>Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz láserico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.</p>
⏏	PAUSE	Apertura/cierre del servo de seguimiento	<p>Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de seguimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que este reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción.</p> <p>Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo láserico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema.</p> <p>Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.</p>

Código	Nombre de la tecla	Fonción en el mode de prueba	Explicación
⏮	TRACK REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el puto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
⏭	TRACK FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el puto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
□	STOP	Parada	Inicializa y se para la rotacion del desco. El captor y el disco permanecen donde están cuando se presiona esta tecla.
△	OPEN/CLOSE	Apertura/cierre de la bandeja del disco	Abrirá/cerrará la bandeja del disco. Esta tecla es baseulante de accion alternativa y abre/cierra la bandeja alternativamente.



[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.

A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

OUTPUT    ⏏

Hará que se encienda el diodo láser y cerrará el servo de enfoque.



PLAY    ▶

Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.



PAUSE    ⏏

Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

## 1. Ajuste del descentramiento del enfoque

<ul style="list-style-type: none"> <li>• Objetivo</li> <li>• Síntomas en caso de desajuste</li> </ul>	<p>Ajuste de la tensión de CC para el amplificador de error de enfoque.</p> <p>El reproductor no enfoca y la señal de RF contiene perturbaciones.</p>		
<ul style="list-style-type: none"> <li>• Conexión de los instrumentos de medición</li> </ul>	<p>Conecte el osciloscopio a TP1, patilla 6, (FCS ERR).</p> <p>[Ajustes]      5 mV/división 10 ms/división modo de CC</p>	<ul style="list-style-type: none"> <li>• Estado del reproductor</li> <li>• Lugar de ajuste</li> <li>• Disco</li> </ul>	<p>Modo de prueba, parado (con el interruptor de alimentación en ON)</p> <p>VR103 (FCS OFS)</p> <p>No es necesario</p>

### [Procedimiento]

Ajuste VR103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de  $-150 \pm 50$  mV.

## 2. Ajuste de retícula

• Objetivo	Alineación de los puntos del haz láserico de generación de error de seguimiento al ángulo óptimo en la pista		
• Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la figura 2)	• Estado del reproductor	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto
	[Ajustes]      50 mV/división 5 ms/división modo de CC	• Lugar de ajuste • Disco	Ranura de ajuste de retícula del captor YEDS-7

### [Procedimiento]

1. Mueva el captor hasta la mitad del disco ( $R=35\text{mm}$ ) con la tecla TRACK FWD  $\gg$  o REV  $\ll$  de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donde puede ajustarse.
2. Presione la tecla OUTPUT, y después la tecla PLAY  $\triangleright$ , por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo. Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la derecha desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la derecha desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

Referencia: En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

Nota : La amplitud de la señal de error de seguimiento será de aproximadamente  $3V_p$ -p (cuando se emplee un filtro de paso bajo de  $38k\Omega, 0.001\mu F$ ). Si esta amplitud es extremadamente pequeña ( $2V_p$ -p o menos), la causa será el funcionamiento malo en el lente objetivo o en el captador. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustarla.

5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK REV  $\ll$ , presione la tecla PAUSE  $\square$ , y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

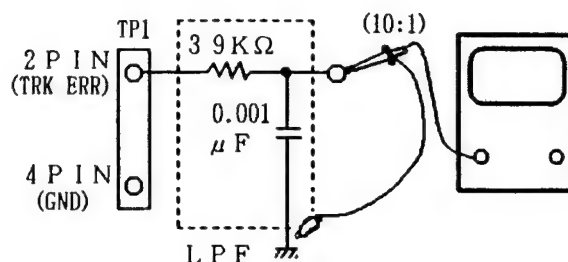
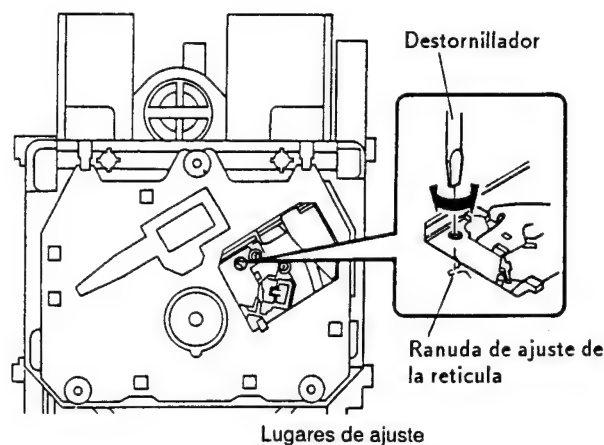


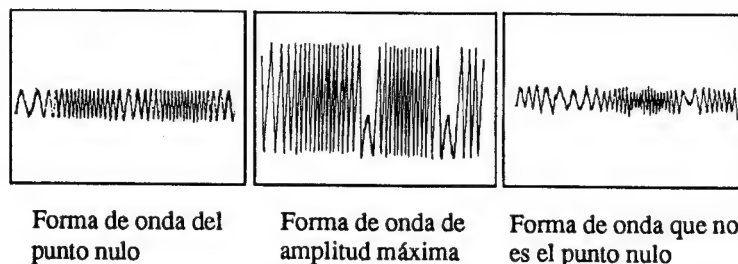
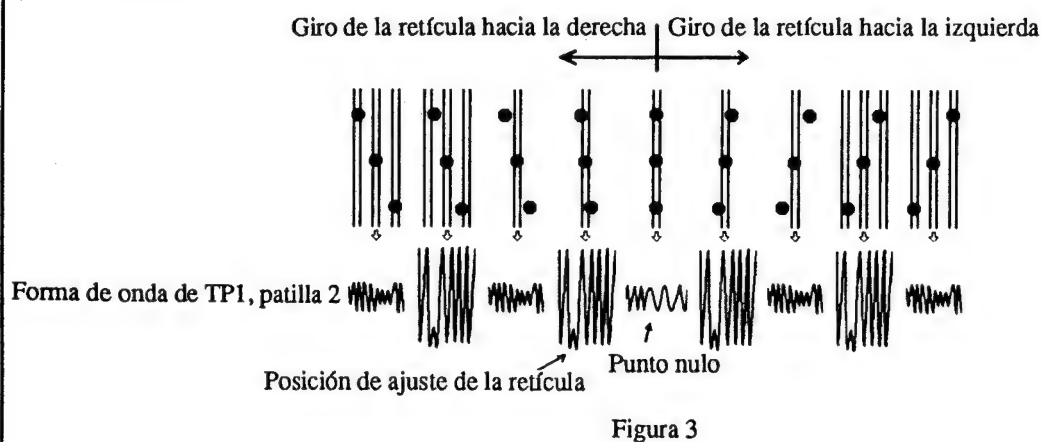
Figura 2



### [Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lásericos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.)

Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.



Forma de onda del punto nulo

Forma de onda de amplitud máxima

Forma de onda que no es el punto nulo

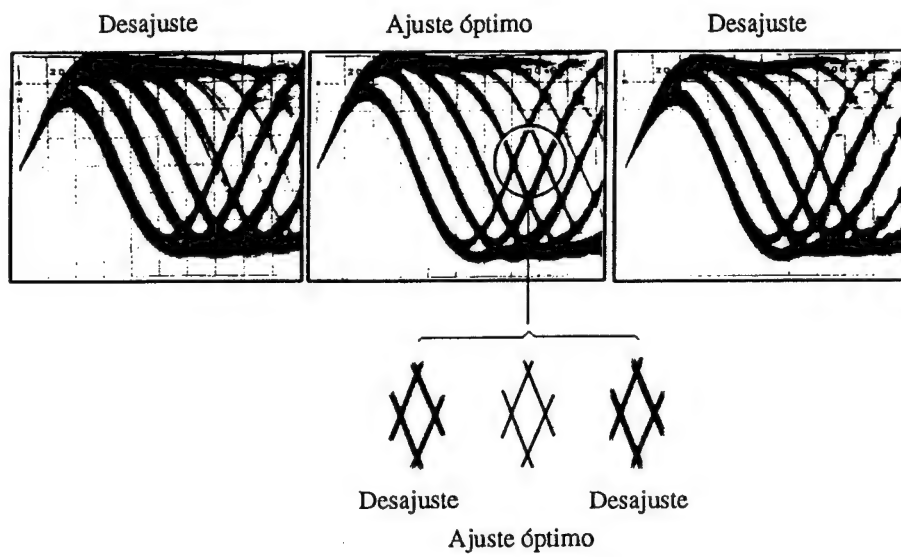


Figura 5 Patron optico



## 5. Ajuste del nivel de RF

• Objetivo	Optimización de la amplitud de la señal de RF de reproducción		
• Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF).	• Estado del reproductor	Modo de prueba, reproducción
	[Ajustes]      50 mV/división 10ms/división modo de CA	• Lugar de ajuste  • Disco	VR1 (potencia de láser)  YEDS-7

### [Procedimiento]

1. Mueva el captor hasta la mitad del disco (R=35mm) con la tecla TRACK FWD ►► o REV ◄◄, presione la tecla OUTPUT, después la tecla PLAY ►, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el modo de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de  $1,2 V_{p-p} \pm 0,1 V$ .

## 6. Ajuste de la ganancia del bucle del servo de enfoque

• Objetivo	Optimización de la ganancia del bucle del servo de enfoque		
• Síntomas en caso de desajuste	La reproducción no se inicia o el actuador de enfoque produce ruido.		
• Conexión de los instrumentos de medición	Consulte la figura 6.	• Estado del reproductor	Modo de prueba, reproducción
	[Ajustes]  CH1                      CH2 20 mV/división      5 mV/división Modo X - Y	• Lugar de ajuste • Disco	VR152 (FCS GAN) YEDS-7

### [Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK FWD  $\gg$  o REV  $\ll$  para mover el captor hasta la mitad del disco (R=35mm), y después presione la tecla OUTPUT, la tecla PLAY  $\triangleright$ , y después la tecla PAUSE  $\square$ , por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

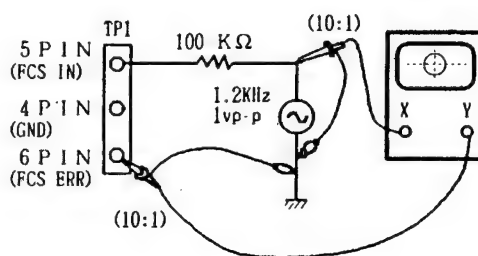
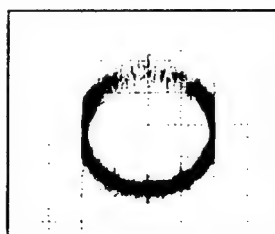


Figura 6

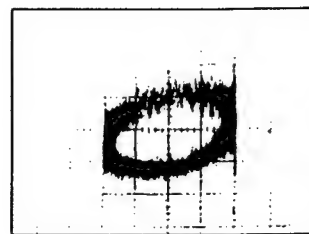
### Ajuste de la ganancia de enfoque



Ganancia superior



Ganancia óptima







Ganancia inferior

## 7. Ajuste de la ganancia del bucle del servo de seguimiento

• Objetivo	Optimización de la ganancia del bucle del servo de seguimiento		
• Síntomas en caso de desajuste	La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
• Conexión de los instrumentos de medición	Consulte la figura 7.	• Estado del reproductor	Mode de prueba, reproducción
	<p>[Ajustes]</p> <p>CH1                      CH2</p> <p>50 mV/división      50mV/división</p> <p>Modo X - Y</p>	<p>• Lugar de ajuste</p> <p>• Disco</p>	<p>VR151 (TRK GAN)</p> <p>YEDS-7</p>

### [Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK FWD  o REV  para mover el captor hasta la mitad del disco (R=35mm), y después presione la tecla OUTPUT, la tecla PLAY , y la tecla PAUSE , por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

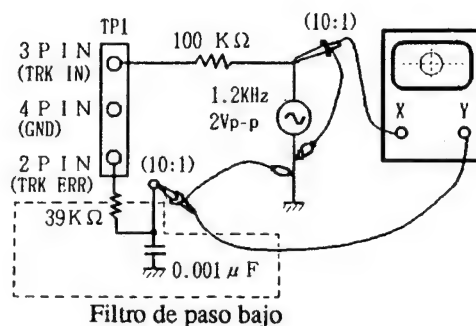


Figura 7

### Ajuste de la ganancia de seguimiento



Ganancia superior



Ganancia óptima



Ganancia inferior

## 8. Verificación de la señal de error de enfoque (curva S de enfoque)

• Objetivo	Juzgar si el captor está bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
• Síntomas en caso de desajuste			
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR).	• Estado del reproductor	Modo de prueba, parada
	[Ajustes]      100 mV/división 5 ms/división modo de CC	• Lugar de ajuste	Ninguno
		• Disco	YEDS-7

### [Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla OUTPUT y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla OUTPUT, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.

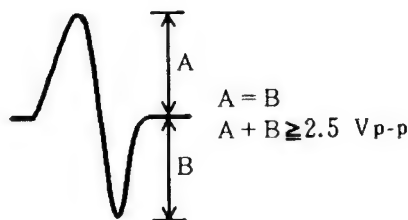


Figura 8

### [Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

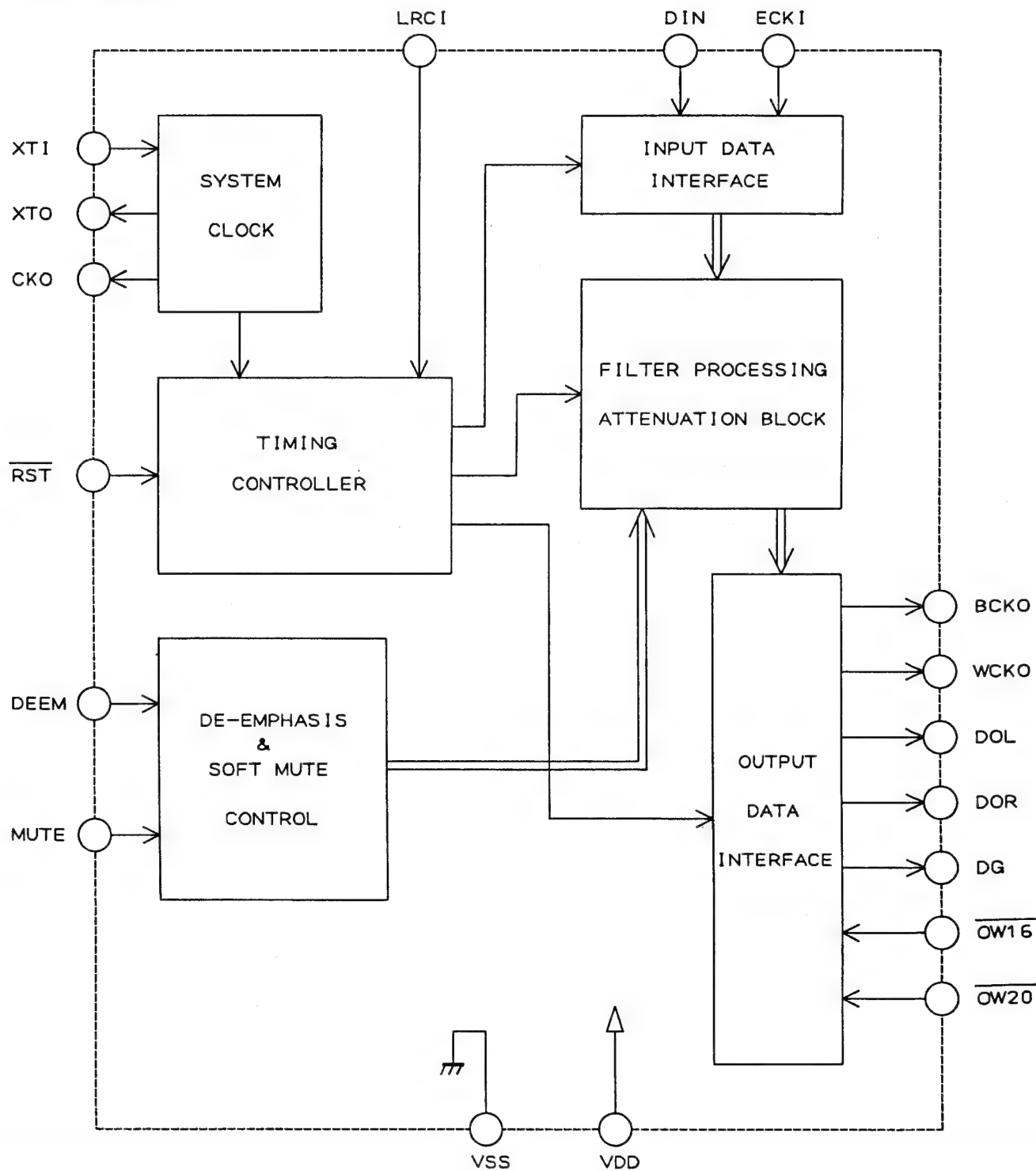
1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negativa de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

## 7. IC INFORMATION

### ■ SM5840CP

Digital Filter

#### ● Block Diagram



## ● Pin Assignment

(TOP VIEW)

$\overline{OW16}$	1	18	DIN
XTI	2	17	BCKI
XTO	3	16	LRCI
CKO	4	15	BCKO
VSS	5	14	VDD
$\overline{OW20}$	6	13	WCKO
DEEM	7	12	DOL
MUTE	8	11	DOR
$\overline{RST}$	9	10	DG

## ● Pin Function

No.	Pin name	I/O	Function
1	$\overline{OW16}$	I	Output bit rate select input 1. (*1)
2	XTI	I	Oscillator input.
3	XTO	O	Oscillator output.
4	CKO	O	Clock output. (Frequency is the same as XTI.)
5	V <sub>SS</sub>	—	GND terminal.
6	$\overline{OW20}$	I	Output bit rate select input 2. (*1) Refer to $\overline{OW16}$ .
7	DEEM	I	De-emphasis signal input. L : De-emphasis OFF, H : De-emphasis ON
8	MUTE	I	Mute signal input. L : Soft mute OFF, H : Soft mute ON
9	$\overline{RST}$	I	System reset signal input. (Initialize)
10	DG	O	De-glitch output.
11	DOR	O	Data output for R ch.
12	DOL	O	Data output for L ch.
13	WCKO	O	Word clock output.
14	V <sub>DD</sub>	—	Power supply input(+5V)
15	BCKO	O	Bit clock output.
16	LRCI	I	Sampling rate(fs) clock input for input data.
17	BCKI	I	Bit clock input
18	DIN	I	Data input

\*1 : Selection of output bit rate.

Settings		$\overline{OW20}$	
		H	L
$\overline{OW16}$	H	18bit output Noise shaper ON	20bit output Noise shaper ON
	L	16 bit output Noise shaper ON	16bit output Noise shaper OFF (test mode)



## 8. FOR PD-9700/KC, HEM, HB AND SD TYPES

### 8.1 CONTRAST OF MISCELLANEOUS PARTS

#### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

The PD-9700/KC, HEM, HB and SD types are the same as the PD-41/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		PD-41 /KU type	PD-9700 /KC type	PD-9700 /HEM type	PD-9700 /HB type	PD-9700 /SD type	
	FL sheet	PAM1514	PAM1514	PAM1251	PAM1251	PAM1514	For packing
	33P F.F.C/30V	PDD1094	PDD1094	.....	.....	.....	
	31P F.F.C/30V	.....	.....	PDD1092	PDD1092	PDD1092	
	Cord with plug(mini plug)	PDE-319	PDE-319	.....	.....	.....	
	Front panel assembly	PEA1167	PEA1166	PEA1166	PEA1166	PEA1166	
	CD packing case	PHG1677	PHG1670	PHG1670	PHG1670	PHG1670	
	Recycle label	PRW1253	PRW1253	.....	.....	.....	
⚠	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1013	
⚠	Strain relief	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	
⚠	Voltage selector	.....	.....	.....	.....	PSB1002	
⚠	Power transformer(8VA)	PTT1166	PTT1166	PTT1167	PTT1167	PTT1168	
⚠	Power transformer(15VA)	PTT1206	PTT1206	PTT1207	PTT1207	PTT1208	
⚠●	MAIN BOARD assembly	PWZ2150	PWZ2150	PWZ2151	PWZ2153	PWZ2151	
⚠	PRIMARY BOARD assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
⚠●	ANALOG BOARD assembly	PWM1490	PWM1490	PWM1490	PWM1492	PWM1490	
●	FUNCTION A BOARD assembly	PWZ2168	PWZ2168	PWZ2169	PWZ2169	PWZ2169	
	FUNCTION B BOARD assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
	Operating instructions (German/Italian/Dutch/Swedish /Spanish/Portuguese)	.....	.....	PRF1048	.....	.....	

**MAIN BOARD ASSEMBLY(PWZ2151 and PWZ2153)**

The MAIN BOARD assemblies (PWZ2151 and PWZ2153) are the same as the MAIN BOARD assembly (PWZ2150) with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		PWZ2150	PWZ2151	PWZ2153	
	D391-D394	1SS254	.....	.....	
	C391	CGCYX103K25	.....	.....	
	C392	CCCSL101J50	.....	.....	
	R391	RD1/6PM244J	.....	.....	
	R392	RD1/6PM102J	.....	.....	
	CN351	HLEM33S	HLEM31S	HLEM31S	
	JA391,JA392	RKN1004	.....	.....	

**PRIMARY BOARD ASSEMBLY**

The PRIMARY BOARD assemblies of PD-9700/KC, HEM, HB and SD are the same as the PRIMARY BOARD assembly of PD-41/KU for the service supply parts.

**ANALOG BOARD ASSEMBLY(PWM1492)**

The ANALOG BOARD assembly (PWM1492) is the same as the ANALOG BOARD assembly (PWM1490) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWM1490	PWM1492	
	L540-L547	PTH1010	.....	

**FUNCTION A BOARD ASSEMBLY(PWZ2169)**

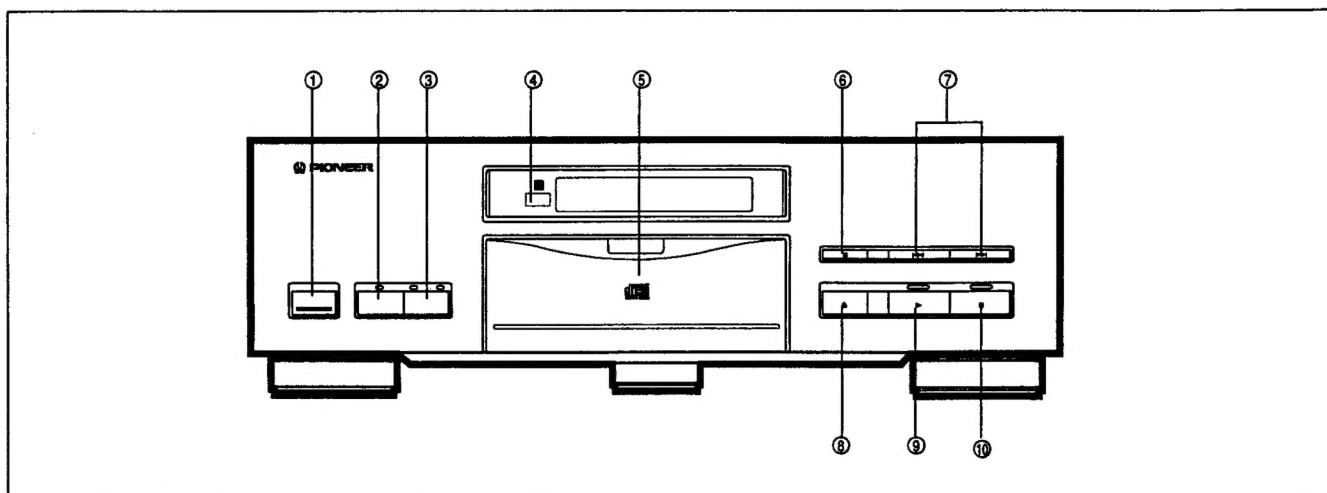
The FUNCTION A BOARD assembly (PWZ2169) is the same as the FUNCTION A BOARD assembly (PWZ2168) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ2168	PWZ2169	
	CN401	HLEM33R	HLEM31R	

**FUNCTION B BOARD ASSEMBLY**

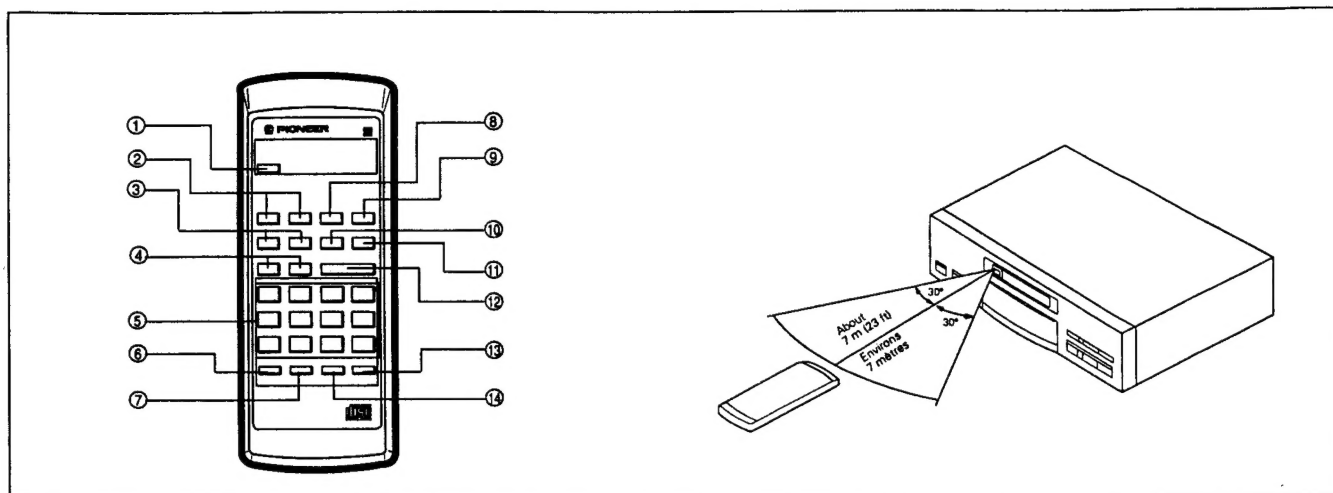
The FUNCTION B BOARD assemblies of PD-9700/KC, HEM, HB and SD are the same as the FUNCTION B BOARD assembly of PD-41/KU for the service supply parts.

## 9. PANEL FACILITIES



### FRONT PANEL

- ① **POWER** switch
- ② **DISPLAY** button and **OFF** indicator
- ③ **OUTPUT** button and **DIGITAL/ANALOG** indicators
- ④ **Remote sensor**  
Receives the signal from the remote control unit.
- ⑤ **Disc tray**
- ⑥ **STOP** button (■)
- ⑦ **TRACK** search buttons (◀◀/▶▶)
- ⑧ **OPEN/CLOSE** button (▲)
- ⑨ **PLAY** button (▶) and indicator
- ⑩ **PAUSE** button (||) and indicator



### REMOTE CONTROL UNIT

Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

- ① **OPEN/CLOSE button** (▲)
- ② **INDEX buttons** (← / →)
- ③ **MANUAL search buttons** (◀◀ / ▶▶)
- ④ **TRACK search buttons** (|◀◀ / ▶▶|)
- ⑤ **Track number/Digit buttons** (1-10, +10, ≥ 20)
- ⑥ **PGM (Program) button**
- ⑦ **CHECK button**
- ⑧ **REPEAT button**
- ⑨ **RANDOM PLAY button**
- ⑩ **PAUSE button** (||)
- ⑪ **STOP button** (■)
- ⑫ **PLAY button** (▶)
- ⑬ **TIME button**
- ⑭ **CLEAR button**

### REMOTE CONTROL OPERATIONS

When operating the remote control unit, point the unit's infrared signal transmitter at the remote control receiver (REMOTE SENSOR) on the front panel of the player. The remote control unit can be used within a range of about 7 meters (23 feet) from the remote sensor, and within angles of up to about 30 degrees.

**NOTE:**

*If the remote control sensor window is in a position where it receives strong light such as sunlight or fluorescent light, control may not be possible.*

## 10. SPECIFICATIONS

### 1. General

Type .....	Compact disc digital audio system
Power requirements	
European model .....	AC 220 - 230 V, 50/60 Hz
U.K. and Australian models .....	AC 230 - 240 V, 60 Hz
U.S. and Canadian models .....	AC 120 V, 60Hz
Other models .....	AC 110/120 - 127/220/240 V (Switchable), 50/60 Hz
Power consumption .....	22 W
Operating temperature .....	+5°C - +35°C +41°F - +95°F
Weight .....	8.0 kg (17 lb, 10 oz)
External dimensions .....	420(W) X 330(D) X 130(H) mm 16-9/16(W) X 13(D) X 5-2/16(H) in

### 2. Audio section

Frequency response .....	2 Hz - 20 kHz
S/N ratio .....	111 dB or more (EIAJ)
Dynamic range .....	98 dB or more (EIAJ)
Channel separation .....	107 dB or more (EIAJ)
Harmonic distortion .....	0.002% or less (EIAJ)
Output voltage .....	2.0V
Wow and flutter .....	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Channels .....	2-channel (stereo)

### 3. Output terminal

Unbalanced type audio line output jacks
Optical and coaxial digital output jacks
Control input/output jacks (U.S. and Canadian models only)
CD-DECK SYNCHRO jack

### 4. Functions

Basic operation buttons
● PLAY, PAUSE, STOP

Search function
● Direct play
● Track search
● Manual search
● Index search
● Time location

### Programming

- Maximum 24 steps
- Pause
- Program check/correction
- Program clear (single track or all tracks)

### Repeat functions

- 1 track repeat
- All tracks repeat
- Program play repeat
- Random play repeat
- Program random play repeat

Random play (repeat also available)

### Switching display

Time consumed, remaining time (track/disc), and total time

### Timer start

### 5. Accessories

● Remote control unit .....	1
● Size AAA/R03/dry batteries .....	2
● Control cord (U.S. and Canadian models only) .....	1
● Output cable .....	1
● Operating instructions .....	1

### NOTE:

*Specifications and design subject to possible modification without notice, due to improvements.*